NDQuits FY17 Evaluation Report

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Introduction

About the Program

NDQuits, the tobacco cessation quitline for North Dakota, is one component of the comprehensive tobacco control efforts of the North Dakota Department of Health (NDDoH). The mission of NDQuits is to "improve and protect the health of North Dakotans by reducing the negative health and economic consequences of the state's number one cause of preventable disease and death – tobacco use[1]". NDQuits has been providing services to North Dakotans since 2004.

For the past five years, National Jewish Health (NJH) has been contracted by NDDoH to provide telephone and online cessation services to North Dakotans interested in attempting to quit tobacco. Eligible residents may either call 1-800-QUITNOW or they may be referred from their health care provider to NJH, who conducts the intake and registration process for NDQuits. Once registered, eligible applicants are transferred to trained tobacco treatment specialists (TTS) from the University of North Dakota's Department of Family and Community Medicine, who conduct the counseling calls. Eligible residents may also register for NDQuits online.

There are three programs that are available to North Dakotans: Quitline only, Web only, or Quitline and web combined. For each program, registrants who are uninsured or underinsured are eligible for up to eight weeks of free nicotine replacement therapy (NRT; combination or mono-therapy) in the form of patches, gum, or lozenges. Combination NRT first became available to participants October 1, 2013.

[1] ND Department of Health (NDDoH). (2017). *NDQuits – About us*. Retrieved from https://ndquits.health.nd.gov/about-us/.

Phone Program

North Dakotans enrolled in the NDQuits telephone counseling may receive up to five free, proactive telephone cessation counseling sessions with a TTS, as well as a printed Quit Guide, supporting emails, and the option to enroll in a text messaging program. Registrants may re-enroll in the quitline every 60 days (since the last phone intake). North Dakotans also have the option of enrolling in both the quitline as well as the QuitLogix web program.

Web Program

The QuitLogix online cessation program, provides tobacco users with online information and support to quit. Registrants are able to develop and complete a quit plan and also have access to the supportive email program. Access to the website content is provided as a "lifetime membership."

Professional Data Analysts (PDA) has been conducting comprehensive formative and summative evaluations of the NDQuits program for the NDDoH for seven years. For Fiscal Year 17 (FY17), data were collected from NDQuits participants by NJH upon completion of intake (participant demographic and clinical data), and throughout program participation (program utilization, medication provision, treatment reach) via phone and web. Outcome data are collected 7-months post-enrollment (program satisfaction, program outcomes) by the Wyoming Survey & Analysis Center (WYSAC). A more detailed description of the data sources, types of data, and survey attrition can be found in Appendix 1. A companion Executive Summary is also available by contacting NDDoH or the primary author of this report.

About This Report

PDA is conducting a process and outcomes evaluation to describe and understand the results of the NDQuits program (see Appendix 2 for details on methodology) as one aspect of North Dakota's comprehensive tobacco control efforts. North American Quitline Consortium (NAQC) serves as a forum for quitline professionals to discuss current issues in tobacco prevention and control and guide best practices in quitline programming[2]. NAQC developed the Minimal Data Set (MDS) to promote intake and follow-up measures that are supported by research and best practices to drive program improvements. NDQuits utilizes NAQC best practices and MDS measures to collect robust data and add to the strong evidence-base of quitlines in North America.

The purposes of this report are to: (a) assess the NDQuits program in terms of enrollments, program use, reach, and outcomes, particularly for priority populations, and (b) offer

[2] North American Quitline Consortium (NAQC). (2017). *History.* Retrieved from http://www.naquitline.org/?page=History.

recommendations for NDQuits in FY18 and beyond. This report will be used to understand areas for improvement in FY18, and outcomes information will be shared with NDDoH and other key stakeholders to communicate who uses NDQuits, to what extent, and to what effect.

Evaluation Questions

This report presents several measures of program use and quality that are provided to NDDoH on an annual basis for the purpose of managing the cessation interventions. These analyses draw from three datasets and answer the following evaluation questions.

1. What was the reach of NDQuits in FY17?
2. How did enrollees learn about and connect with NDQuits in FY17?
3. What were the NDQuits participant characteristics in FY17?
4. What were patterns of use for NDQuits participants in FY17?
5. What were patterns of NRT provision and use in FY17?
6. What were program quit outcomes for FY17?
7. What were the patterns of Electronic Nicotine Delivery System (ENDS) use?
8. To what extent were participants satisfied with the services received in FY17?
9. What was predictive of quitting overall?

Limitations

Some of the data used in the analyses reported here had important limitations, and therefore some results should be interpreted with caution. The three high level limitations are summarized here, and notes of how this specifically impacts results are also noted, as needed, throughout the results sections. Implications for both the evaluation and for NDDoH are also noted.

First, NJH introduced a new website in April 2017, which led to revision of the Client Data Extract (intake data). Due to these revisions some data points were not reportable because of data quality concerns and/or timing of data receipt. Data not reportable in FY17 included: whether e-cigarettes were used to assist with quitting, whether e-cigarette contained nicotine, intention to quit e-cigarettes, overall health, mental health, and physical health. Additionally, NJH was unable to provide web utilization data for the new website. For this reason, comparisons of web utilization across fiscal years were not possible and only web enrollments from July 2016 – March 2017 had reportable utilization data for this report. Finally, while NDDoH requested evaluation of the effects of the American Indian protocol, this protocol was

not implemented until October 2017. As such, PDA will evaluate the American Indian counseling protocol in the FY18 report.

Second, the response rate for the 7-month follow-up survey was 22%, which is much lower than the NAQC recommended 50%. After analyzing the demographics of respondents in this dataset for FY17 in relation to past data (FY14, FY15, and FY16), PDA learned that the NDQuits users who responded to the survey in FY17 were a more homogeneous group with characteristics of those more likely to be quit from tobacco. These include:

- More affluent (higher education level, more private insurance)
- Less addicted to tobacco at intake (less frequent cigarette use, fewer cigarettes smoked per day, longer time after waking before smoking)
- More intense use of NDQuits (fewer web only registrations, more combination NRT)

These characteristics most likely inflated the FY17 quit rate.

Third, when combining all outcome data from FY14 – FY17, some data endpoints had a high amount of missing data for the web program especially (see Appendix 6 for more details). This means that some analyses for the combined outcomes dataset were limited to phone program only.

Table 1: Summary of FY17 data issues

Data issue	Implication to Evaluation	Implication to NDDoH
Unreportable data points in FY17 intake dataset: • E-cig use to assist with quitting • E-cig use containing nicotine • Intention to quit E-cigs • Overall health • Mental health • Physical health	Unable to analyze data Unable to include as predictors of quitting	E-cig use has been on the rise and not having this data point inhibits NDDoH's ability to understand the specific landscape in North Dakota. Similarly, not having health-related information inhibits understanding of how some priority populations use and are impacted by NDQuits.
NJH unable to provide web utilization data for new website.	Cannot compare web utilization across fiscal years	NDDoH unable to make programmatic decisions based on utilization data.

	Cannot analyze web utilization for April 2017 - June 2017	
Follow-up survey response rate of 22% (NAQC recommends 50%)	Possibly inflated quit rate Response bias concerns	The follow-up data is necessary to understand outcomes, and a low response rate reduces confidence in the stated outcomes. North Dakotans using NDQuits are not adequately represented in the follow-up sample.

Definition of Terms

Program: In the past, PDA defined program as the program used. In FY17, PDA defined program as the *program requested at time of registration*. Outcomes are now reported by program requested at registration to align the evaluation with NAQC best practices. This means the quit rate for the web program now includes some participants who also received phone counseling, and the quit rate for those who did not use any program components is not calculated. As such, comparisons of by program quit rates should not be made between FY17 and previous FY. Comparisons of the overall quit rates are appropriate.

Program used*:* Program used is defined as the program(s) used by participants from the time of registration through the end of the FY. Possible values for *program used* include no program, phone (w/or w/out web), or web only. Characteristics of participants and utilization of program components are reported by program used.

Treatment reach: The ratio of tobacco users who receive treatment (defined as one or more counseling calls, one or more logins to the website, or one or more shipments of NRT) from a state's tobacco cessation quitline to the number tobacco users statewide. Please note this varies slightly from NAQC definition of treatment reach which only includes those with counseling and/or NRT shipments.

Unique individual: Unique individual refers to a single tobacco user. PDA matches records within and across programs to identify unique individuals (using the NJH unique person identifier of patient id (PTID)) who may have more than one referral or enrollment. Data reported at the unique individual level includes the number served, reach rates, participant

demographics, participant program utilization, referrals, and participant outcomes (quit rates, medication use, e-cigarette use, and satisfaction).

❶ What was the reach of NDQuits in FY17?

In Section 1 the number of unique tobacco users who registered for NDQuits services in FY17 is detailed, in addition to treatment reach overall, by program, and by human service region (using FY17 intake data).

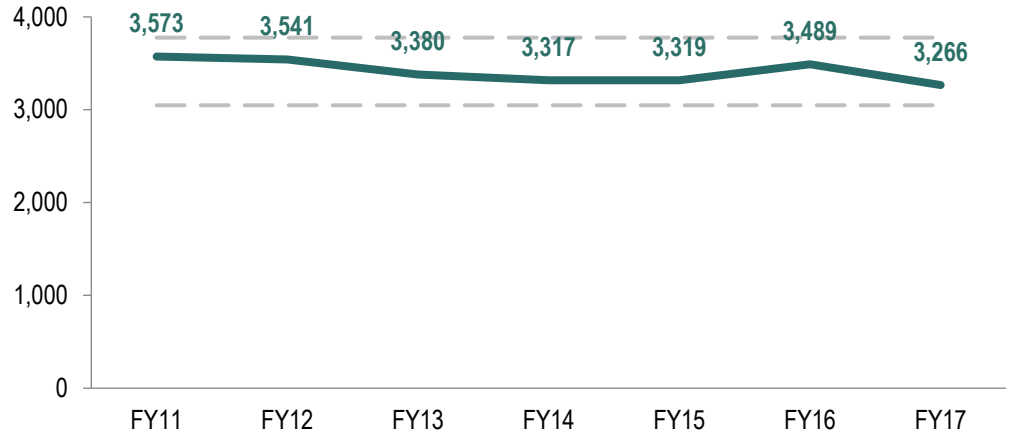
Key findings:

- From FY12-FY17, program registrations and treatment reach remained stable; while treatment reach, at 1.50%, was below the CDC benchmark, it was similar to what is achieved by other states.
- Treatment reach was greatest for the phone (0.83%) than web (0.63%) program.
- American Indians/Alaskan Natives, who have a 50% prevalence rate, will be offered a tailored protocol in FY18. Treatment reach was calculated for this group (0.85%) as a baseline for more targeted evaluation moving forward.
- There were some notable variations in reach by geography, with reach being higher in the Eastern Service Regions (1.70%) than the Western Service Regions (1.30%).
- Regions with the highest tobacco use rates (cigarette and smokeless tobacco use prevalence combined) had the lowest reach rates (Northwest Region and Lake Region), and the regions with the lowest prevalence had the highest reach rates (Southeast and South Central).

Program registrations remained stable for the past seven years

In FY17, a total of 3,266 unique tobacco users registered for NDQuits services. This was comparable to previous fiscal years (see Figure 1). As demonstrated by the grey dotted lines (the upper and lower control limits), the total number of registrations from FY17 is within three standard deviations of the mean number of registrations since FY11. While there was a slight dip, it is reasonable that this decrease is due to natural variance.

Figure 1: Unique tobacco registrants in FY17



Treatment reach slightly decreased from FY16

Reach has been calculated for the state of North Dakota as well as for each of North Dakota's eight Human Service regions. The North Dakota Department of Human Services (NDDHS) works in eight regional human service centers across the state to provide a variety of community-based services related to mental health, aging, developmental disabilities, addiction treatment, outreach, and other human services[3]. In addition, the regions are funded at different levels (the Southeast Human Service Center received the most funding in the 2015-2017 biennium at $37,643,377)[4]. As a partner of NDDHS in addiction treatment, NDDoH wanted to further examine how tobacco prevalence and reach differed (or not) between regions. See Appendix 3 for more information about how reach is calculated.

Treatment reach is the ratio of tobacco users who receive treatment from a state's tobacco cessation quitline to the number of tobacco users statewide. It is an important calculation because it helps the tobacco control community understand the potential impact of quitline services on tobacco prevalence in the state.

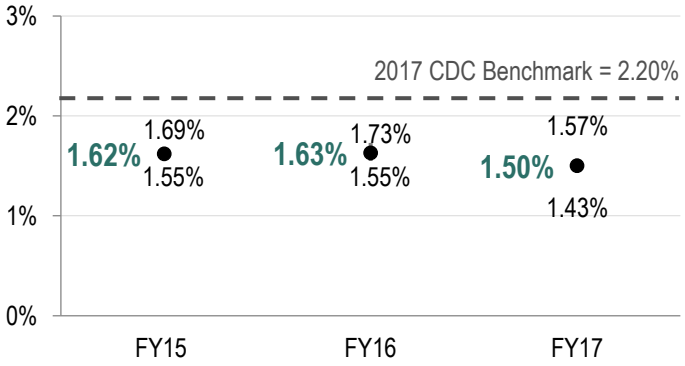
Overall, the North Dakota statewide treatment reach for all programs combined was 1.50% in FY17. Reach was greatest for the phone program (0.83%). Web was the next highest reach (0.63%) followed by reach for those who used both the phone and web programs combined

[3] North Dakota Department of Human Services (NDDHS). (2015). *Regional Human Service Centers.* Retrieved from https://www.nd.gov/dhs/info/pubs/docs/hsc-contact-info.pdf.

[4] North Dakota Department of Human Services. (2015). *North Dakota Department of Human Services 2015-2017 biennial report – Working to improve the lives of North Dakotans.* Retrieved from: http://www.ndhealth.gov/publications/bienrpt/BiennialReport2015-2017.pdf?v=2.

(0.04%). Treatment reach for FY17 did not meet the CDC grant goal of 2.2% by July 2017, and decreased slightly from FY16 (Figure 2) but is comparable to previous fiscal years.

Figure 2: FY17 Comprehensive treatment reach vs the CDC Quitline Capacity Grant Objective



In 2016, **American Indians/Alaskan Natives** (AI/AN) had a 50.0% prevalence rate across the state, twice that of the general population rate of 24.4% (ND Behavioral Risk Factor Surveillance System (BRFSS), 2016). NDDoH has specifically focused on targeting AI/AN tobacco users via NDQuits, and implemented a targeted counseling protocol on October 1, 2017. This protocol is expected to improve treatment reach to AI/AN populations in ND and will be evaluated fully in FY18.

To provide a baseline for the FY18 evaluation, we looked at the treatment reach for this priority population. The overall reach rate was 0.85%. As was the case for the general population, the reach rate for AI/AN tobacco users was higher for the phone program (0.71%) than the web program (0.14%) or both programs combined (0.0%).

Treatment reach was greatest for the phone program

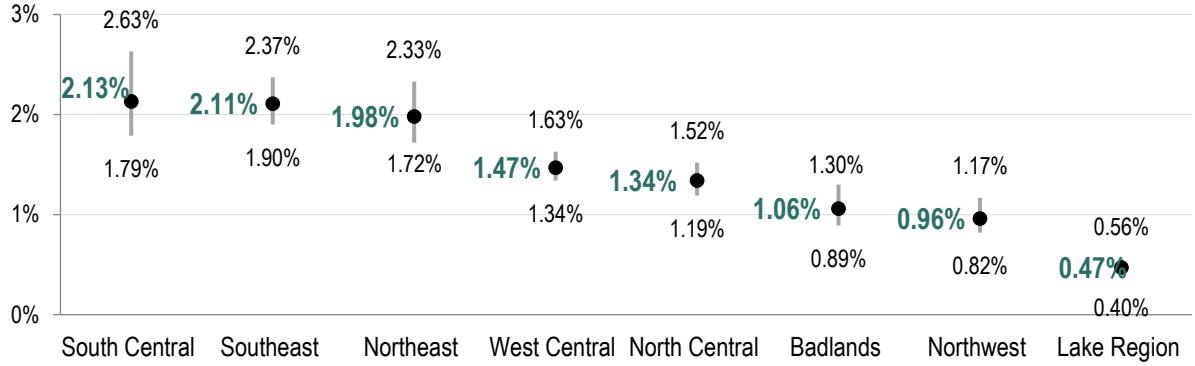
When looking at **reach by program used**, the NDQuits phone program reach was 0.83%, which is similar to FY16 (0.87%). Web reach in FY17 was lower than phone reach at 0.63% and was lower than web reach in FY16 (0.71%). Similar to last year, dual program use was minimal, with only 0.04% of tobacco users using both the web and phone programs, similar to FY16 (0.05%) and FY15 (0.06%). Reach by **type of tobacco use** is similar in FY17 when compared to FY16. Reach was greatest for cigarette users in FY17 (1.73%), when compared to smokeless users (0.45%), and those that used both cigarettes and smokeless tobacco (0.74%).

Treatment reach was greater in the Eastern Service Regions

Reach was greater in the Eastern Service Regions (1.70%) than the Western Service Regions (1.30%). When looking at the **eight Human Service Regions** individually, the highest reach was

in the South Central region (2.13%), while the lowest reach was in the Lake Region (0.47%, see Figure 3). One region, Lake Region, experienced a significant decrease in treatment reach when compared to FY16, while reach from the remaining regions were relatively stable from FY16 to FY17.

Figure 3: FY17 Comprehensive treatment reach by Human Service Region



Similar to the previous fiscal year, the regions with the highest tobacco use rates (cigarette and smokeless tobacco use prevalence combined) had the lowest reach rates (Northwest Region and Lake Region), and the regions with the lowest prevalence had the highest reach rates (Southeast and South Central, see Figure 4 and Figure 5). As the northwest region has many oil fields, there may be more smokeless tobacco users, which may also impact the high tobacco use rates in this area. In addition, the regions differ by population and density, as the Lake Region includes AI/AN North Dakotans, and the Northeast and Southeast are more urbanized.

Figure 4: Overall reach in FY17 by human service region

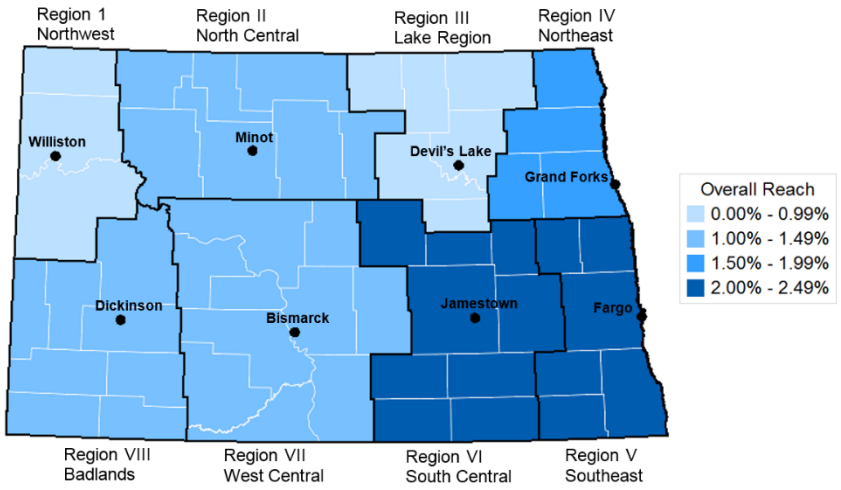
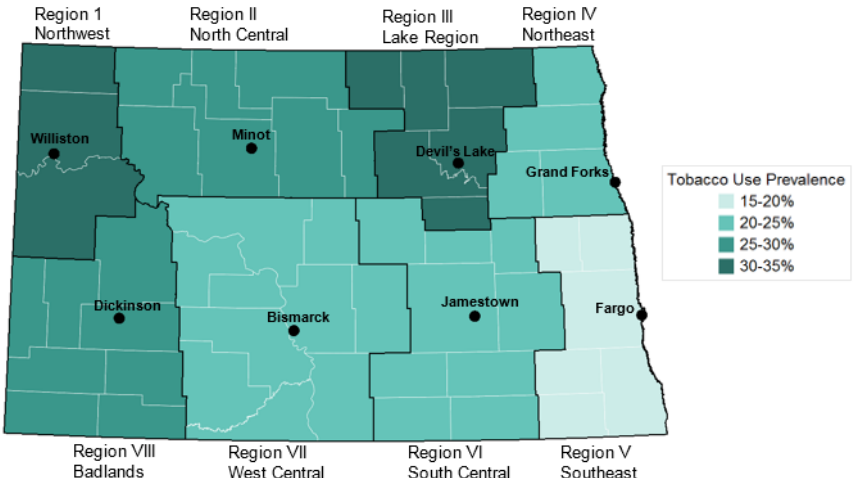


Figure 5: North Dakotan adult tobacco use prevalence in FY16 (BRFSS)



When looking at North Dakotans who used both cigarettes and smokeless tobacco, the prevalence rate was 2.6% statewide (3.1% in the Western Service Region and 2.2% in the Eastern Service Region). The overall treatment reach rate was 0.74%. In contrast to any tobacco user, the reach for dual users (cigarette and smokeless) was higher for the web program (0.48%) than the phone program (0.23%) or both programs together (0.02%). The reach rate for dual users (cigarettes and smokeless tobacco) was 0.77% in the Western Service Region and 0.73% in the Eastern Service Region.

To the extent possible, given the reduced health communications budget, PDA recommends placing higher levels of cessation media (CDC Tips broadcast ads) and other outreach in regions with the highest tobacco prevalence to increase program reach. Given limited resources for media campaigns at CDC's recommended gross rating points (GRP) level, such outreach might maximize the impact of NDQuits by reaching regions with high prevalence.

❷ How did enrollees learn about and connect with NDQuits in FY17?

The focus in this section is on the referral sources and resulting enrollments by source for FY17 (FY17 intake data). In addition, some details are reported on phone registrants' awareness of the CDC Tips Campaign (using FY17 intake data).

Key findings:

- In FY17, 83% of referrals from providers were sent via fax.
- The conversion rates of provider referrals to intake completion were high in comparison to the NAQC average (25%).
- Of those referrals who completed the NDQuits intake, almost 70% received NAQC-defined minimal treatment.
- In FY17, over 60% of phone enrollees were aware of the CDC Tips media campaign.

Referral sources

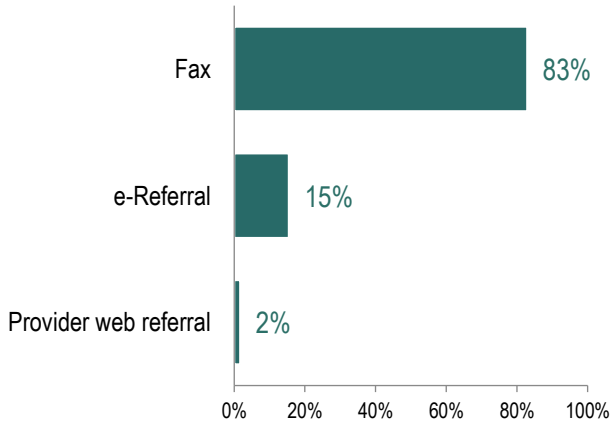
Referrals to NDQuits primarily come from health care systems. There are three methods of providing a referral: 1) fax referrals, 2) e-referrals, and 3) provider web referrals. The provider web referrals were launched in April 2017, and allow a health care provider to login to the NDQuits website and refer a person through the website.

Over 8 in 10 referrals from providers were sent via fax

For FY17 (using the FY17 referral dataset), a total of 1,194 referrals were made to NDQuits through a provider referral source, which comprised 1,027 unique referrals.

Of the unique people referred to NDQuits, 83% (851) were referred via fax, 15% (159) were referred via e-referrals, and 17 registrants (2%) were referred via the web by providers (Figure 6). NDDoH expanded the number of North Dakota Quitline Cessation (NDQC) grantees in FY18, which may increase the total number of referrals to NDQuits. PDA recommends NDDoH possibly expanding work to explicitly build on the work of the Local Public Health Unit

Figure 6. Referrals to NDQuits in FY17

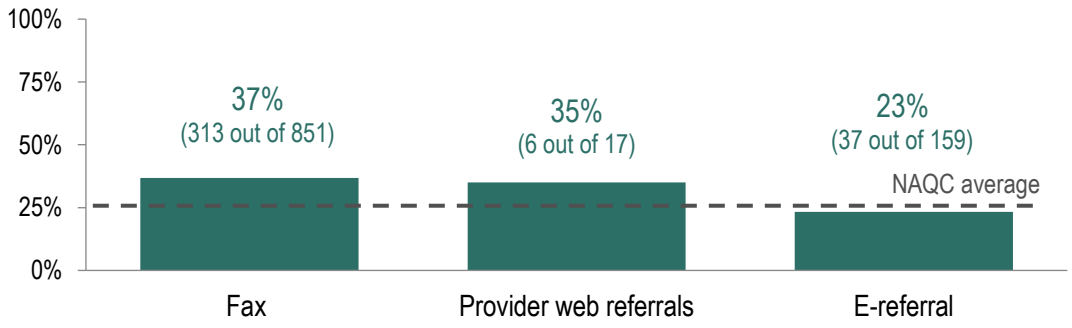


(LPHU) grantees to increase provider education about NDQuits.

Conversion rate from referral to intake completion in FY17 remained high in comparison to national averages

Of the 1,027 unique tobacco users referred, 356 completed intake for NDQuits, resulting in a **35% conversion rate**. Fax referrals continued to have the highest conversion rate of the three referral sources. Of the unique referrals in FY17, 37% of fax referrals and 35% of provider web referrals completed program intake, whereas only 23% of e-referrals completed program intake ($\chi^2(2) = 10.799$, $p=0.005$). For comparison, the 2016 NAQC Annual Survey of Quitlines reports that among U.S. quitlines responding to the survey (n=50 quitlines), 25% of referrals enrolled in a quitline[5]. All referral sources for NDQuits are in line with the NAQC average (Figure 7).

Figure 7: Conversion rates from referral to registration and the number of registrations by referral source



Almost 7 in 10 participants who were referred by providers and registered for NDQuits received minimal treatment

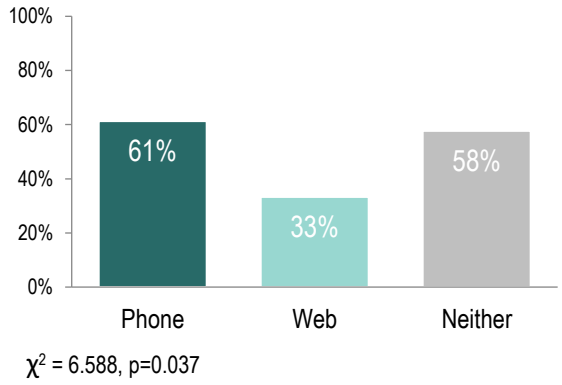
Among the referrals who registered (356), 69% (245) received NAQC defined minimal treatment (a call, and/or NRT). NDQuits participants who were referred by a provider and received treatment all used the phone program and/or were shipped NRT. No referrals had only web program usage. This indicates that treatment delivery among those entering the program through provider referrals is strongly evidence-based and meets the definition of NAQC treatment. Delivery of evidence-based treatment to referrals is a success of the referral process and should be celebrated.

[5] North American Quitline Consortium (NAQC). (2016). Results from the 2016 NAQC Annual Survey of Quitlines. Retrieved from http://www.naquitline.org/?page=2016Survey.

The number of e-referrals and provider web referrals remains much lower than fax referrals. Web-based referrals are new to ND since April 2017 and as such may not be fully adopted by referral networks. Additionally, three health systems implemented bi-directional electronic referral processes with NJH in FY17 but may need more time to impact the number of e-referrals. However, regardless of time needed for full adoption of new referral modes, it is expected that e-referrals will be more equitable to fax referrals in terms of conversion to registration and treatment. As the conversion rate for e-referrals was slightly below the NAQC average and was provided lower rates of treatment than fax or provider web referrals, PDA recommends that NDDoH continue to work with providers to increase capacity for EHR referrals to result in program use. PDA recommends continued monitoring of referral numbers and conversion rates to assess whether differences by referral source persist.

Of FY17 phone enrollees, about 6 in 10 were aware of the CDC Tips media campaign

Figure 8. Awareness of the CDC Tips campaign



Previous research has shown that CDC Tips campaigns have increased average weekly calls to the national quitline portal by 75% compared to the four weeks prior to the campaign[6] (Morbidity and Mortality Weekly Report (MMWR), 2013). Considering the multiple ways North Dakota residents learn about NDQuits, PDA examined the extent to which enrollees reported awareness of this campaign using the FY17 intake dataset. Of the 1,891 participants who completed intake for the phone program in FY17, 57% (1,084 participants) reported awareness of the CDC Tips campaign. Of the phone registrants, more phone users (61%) and NDQuits registrants who did not use either the phone or web program (58%) reported seeing the CDC Tips campaign than web users (33%). This difference is statistically significant (Figure 8). In the current health communications plan for FY18 it is recommended that CDC Tips ads continue to be used to promote cessation and NDQuits. This approach is supported by CDC best practices; given the limited media resources, targeting higher GRPs in areas with high prevalence might be considered as one method of targeting resources to

[6] Morbidity and Mortality Weekly Report (MMWR). (Sept 20, 2013). *Impact of a National Tobacco Education Campaign on Weekly Numbers of Quitline Calls and Website Visitors – United States, March 4 – June 23, 2013.* Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6237a3.htm?s_cid=mm6237a3_w.

maximize impact. Additional media efforts by the LPHU grantees might also support and enhance these efforts.

❸ What were the NDQuits participant characteristics in FY17?

This section highlights the characteristics of tobacco users who used each program in FY17 (FY17 intake data). See Appendix 4 for a complete table of participant characteristics as well as those of tobacco users statewide.

Key findings:

- NDQuits was successful at reaching pregnant females and smokeless tobacco users in FY17, but somewhat less successful at reaching AI/AN tobacco users when compared to North Dakotan tobacco users statewide.
- Issues persist when converting registrants into program users. More AI/AN and pregnant tobacco users did not use any program (compared to those who used the phone or web), and large percentages of NDQuits registrants who were on Medicaid (16%) and who used smokeless tobacco (13%) did not use either program in FY17.

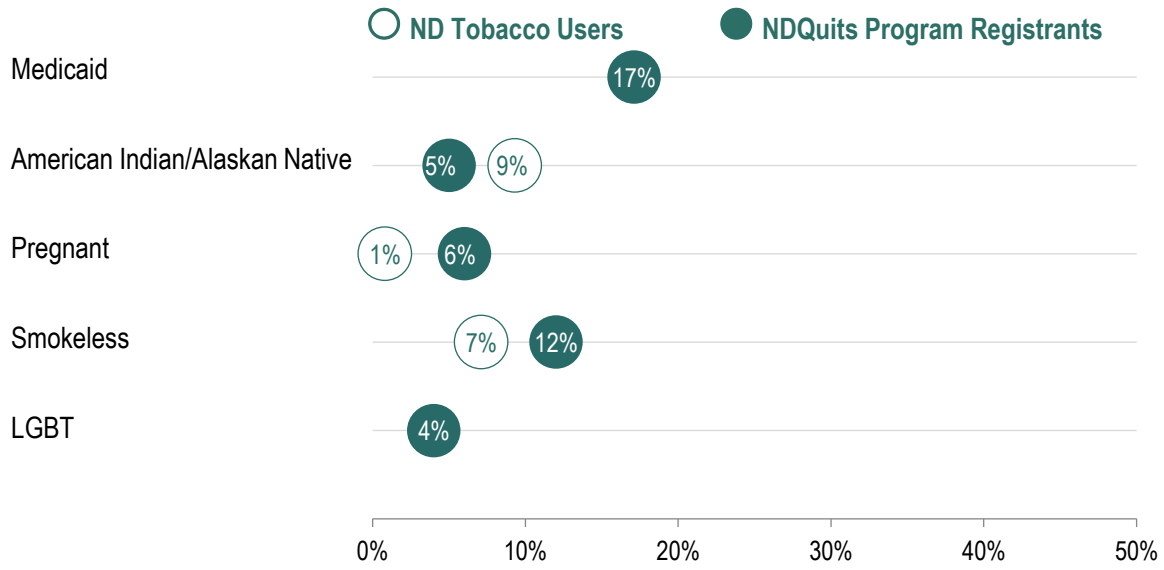
NDQuits is reaching priority populations to varying degrees

There are five groups of tobacco users that NDDoH is interested in reaching: those with Medicaid health insurance, American Indians/Alaskan Natives, pregnant women, those from the lesbian, gay, bisexual, transgender (LGBT) community, and smokeless tobacco users.

- In FY17, 577 registrants (17%) indicated they were insured by Medicaid, which exceeded the Quitline Capacity goal of increasing Medicaid enrollees to 555 by July 2017 (Figure 9).
- There were 158 registrants (5%) who were American Indian or Alaskan Native (AI/AN), which falls short of the Quitline Capacity goal of increasing the number of NDQuits enrollments coming from North Dakota American Indian adult tobacco users to 275 by July 2017. Further, the number of registrants who are AI/AN has decreased the past two fiscal years, and the proportion served in FY17 (5%) was slightly lower than the proportion of AI/AN tobacco users statewide (9%).
- Of the 1,020 females who were 18 – 44 years old, 61 (6%) reported pregnancy, which was greater than the proportion of pregnant tobacco users statewide (0.8%). Of these, 42 registered for the special pregnancy programs offered by NJH, and 22 went on to use the phone program (20 did not use any program).

- The number of registrants who were smokeless tobacco users remained stable from FY16 to FY17, with only a slight drop from 384 to 358. NDQuits served a larger proportion of smokeless tobacco users compared to the proportion statewide (12% versus 7%, respectively).
- In FY17, 121 registrants (4%) were from the LGBT community (no statewide comparison available).

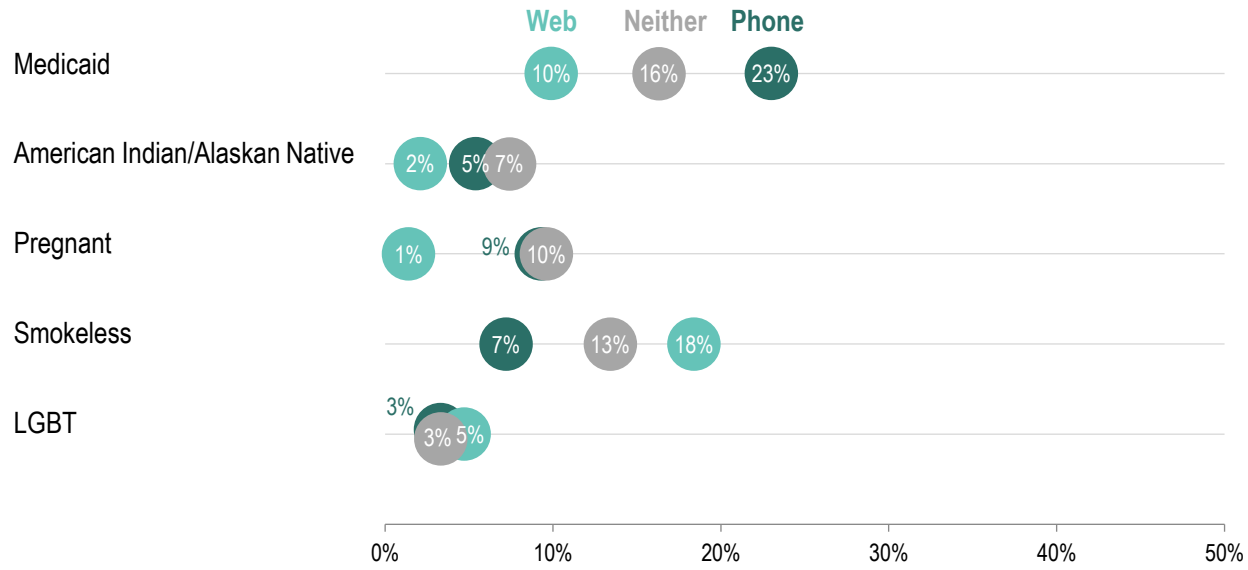
Figure 9: NDQuits registrants from special populations compared to tobacco users in North Dakota (BRFSS)



Note: BRFSS data was not available for Medicaid and those from the LGBT community.

PDA also examined priority populations served by the program. As shown in Figure 10, the proportion of participants who were AI/AN or pregnant was highest for those who used neither the phone or web programs. Further, a strong minority of smokeless tobacco users (13%) and tobacco users insured by Medicaid (16%) did not use either program (Figure 10). PDA recommends that NDDoH continue to target priority populations via grantee outreach and determine strategies to better connect these important populations to either the phone or web programs. For example, NDDoH attempted to implement a special phone counseling protocol for AI/AN tobacco users, but NJH did not implement this protocol as previously agreed upon. The AI/AN protocol started Oct 1, 2017, and analyses of these program users will be included in the FY18 report.

Figure 10: NDQuits registrants from special populations by program used



Finally, PDA examined intake data from all NDQuits registrants and found the following key points:

- Overall, NDQuits registrants were more likely to be heterosexual, white, female, 25-34 years old, privately insured, and had at least a high school degree.
- Overall, NDQuits registrants were more likely to smoke cigarettes only, smoke every day, were heavy tobacco users, and had at least three previous quit attempts.

More details on the demographic and tobacco use characteristics of NDQuits registrants using the FY17 intake data can be found in Appendix 4.

❹ What were the patterns of use for NDQuits?

Section 4 presents results of analyses from the full fiscal year, individual tobacco user data (FY17 intake/utilization dataset). This dataset includes all NDQuits participants with intake data from FY17 – registrations from July 1, 2016 to June 30, 2017. This dataset is used for big-picture descriptions of program registration and use, including how many individuals selected each primary program, and how many received an evidence-based cessation treatment.

Key findings:

- PDA was not able to calculate program registration and utilization data (to compare over time), as the intake extract was pulled at the completion of the FY17 rather than monthly as in previous FYs and NJH was unable to provide web utilization data for the new website that launched April 2017.
- Similar to the past two years, in FY17 70% of all registrants received services but 30% of NDQuits registrants did not use either program. AI/AN and pregnant women had higher percentages of non-usage than the overall average[7].
- Over 62% of FY17 unique registrants received NAQC-defined minimal treatment.
- About three-fourths of phone and web users were shipped NRT.

PDA was unable to compare program registration over time, as the timing of the intake data pull from NJH altered registration data

There is concern that FY17 data are not exactly comparable to previous years and conclusions should be drawn with caution. In previous years, data were received monthly and therefore showed what program(s) people initially requested, regardless of what they used or the intake components they completed. In FY17 intake data were pulled retrospectively, meaning that program selection was updated for those web enrollments who selected dual program but then never went on to complete the phone portion of intake.

About 6 in 10 registrants received NAQC-defined minimal treatment in FY17

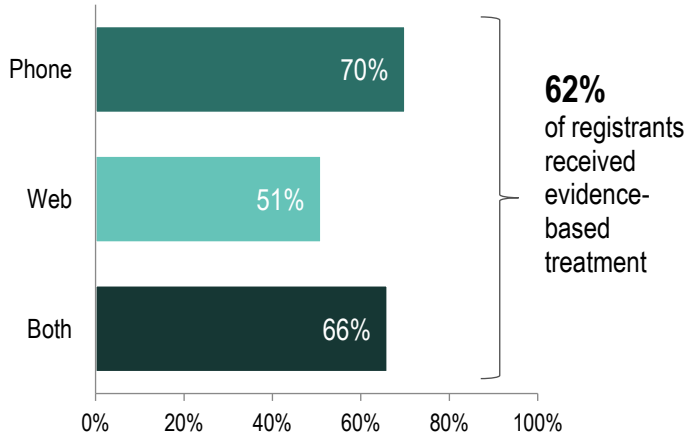
Using FY17 utilization data, of the 3,266 unique registrants, 62% received evidence-based treatment, defined by NAQC as at least one call or NRT shipment. This falls below the average of 86% across all US quitlines in FY16[8]. More phone registrants received minimal treatment

[7] Please note that this percentage is likely less than 30%, as PDA was unable to calculate web use data from April 2017 – June 2017 (so these potential web users were included as non-users).

[8] North American Quitline Consortium (NAQC). (2016). Results from the 2016 NAQC Annual Survey of Quitlines. Retrieved from http://www.naquitline.org/?page=2016Survey.

(70%) than web registrants (51%) or both phone and web registrants (66%), and this difference was significant ($\chi^2(2) = 112.571$, $p<0.001$).

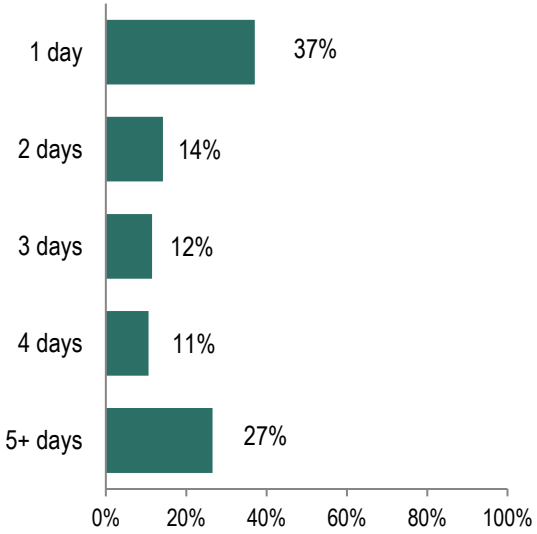
Figure 11: Percent of registrants who received evidence-based treatment



Almost three in ten phone participants received five or more days of counseling in FY17

Of the 3,266 unique tobacco users who registered for the NDQuits program in FY17, 1,326 participants (40.6%) went on to **use the phone program** (phone only or phone and web program). As shown in Figure 12, 37% of all phone users had one day of counseling, 14% had two days of counseling, 12% had three days of counseling, 11% had four days of counseling, and 27% had five or more days of counseling. The percent of participants who had five or more days of counseling remains high compared to other quitlines, possibly due to the dedicated counselors. Among those who used the phone program, participants had between one and 26 days of counseling, and the average days of counseling was 3.21 (SD = 2.78). Most phone users were shipped at least one NRT shipment (1,026 users, or 77.4%) which is similar to FY16 (1,062 users). In addition, 843 phone users (64%) received at least one text message in FY17, a slight increase from FY16 (775 users) (data not graphed).

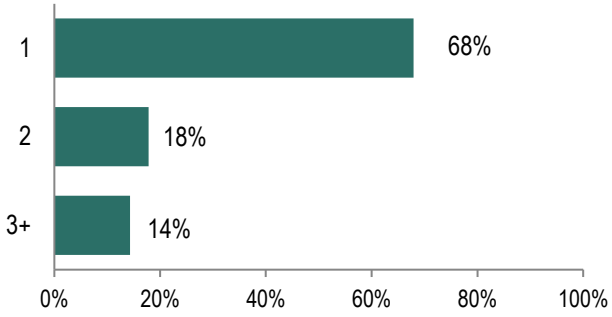
Figure 12: Number of days of counseling for phone users in FY17 (n=1,326)



The majority of FY17 web users logged into the program one day

Of the 3,266 unique tobacco users who registered for NDQuits in 2017, 848 participants (26%) went on to use the web program (web only or phone and web programs) from July 2016 – March 2017[9]. Of the 848 web users, 576 (68%) had one day of web logins, 151 people (18%) had two days of logins, and 121 people (14%) had three or more days of logins (Figure 13, $\chi 2(1)=44.81$, $p<.00010$). Among those who used the web program, participants had between 1-3 days of logins, and the average number of days of logins was 1.46 (SD = 0.73). A total of 706 web users ordered at least one shipment of NRT, slightly more than in FY16 (602 people).

Figure 13: Number of days NDQuits web users logged in during FY17 (n=848)



Since FY15, about 30% of registrants continued to not use any program components[10]

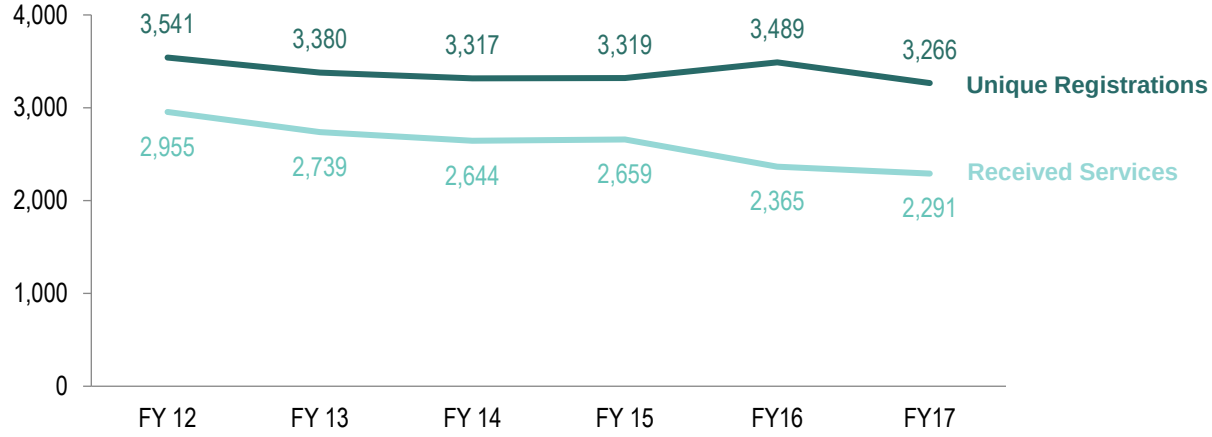
PDA examined all NDQuits participants using the FY17 intake dataset to learn the number of unique tobacco users who registered to receive NDQuits services in FY17. A total of 3,266 unique tobacco users registered for the phone and web programs, which is a slight decrease when compared to FY16 but not significantly different. Of these 3,266 registrants, 70% (2,291) received services (one or more login, call or shipment of NRT), compared to 68% of registrants receiving services in FY16 and 80% of registrants receiving services in prior years. Please note that the percentage of registrants who received services is likely higher, but NJH was not able to provide web utilization data from April 2017 – June 2017 (as PDA was unable to verify web utilization, these potential program users were classified as non-users). As in previous years, PDA continues to recommend deeper investigations into this consistent pattern of low utilization among NDQuits registrants. Additionally, web utilization is only available through March 2017 registrants. After the new website launch in April 2017, website utilization is no longer available. The unavailability of web utilization data for the end of FY17 likely inflated

[9] NJH was not able to provide PDA with web utilization data from April 2017 – June 2017.

[10] Please note that this percentage may be less than 30% for FY17, as PDA did not receive web use data from April 2017 – June 2017 from NJH (so potential web users were included as non-users).

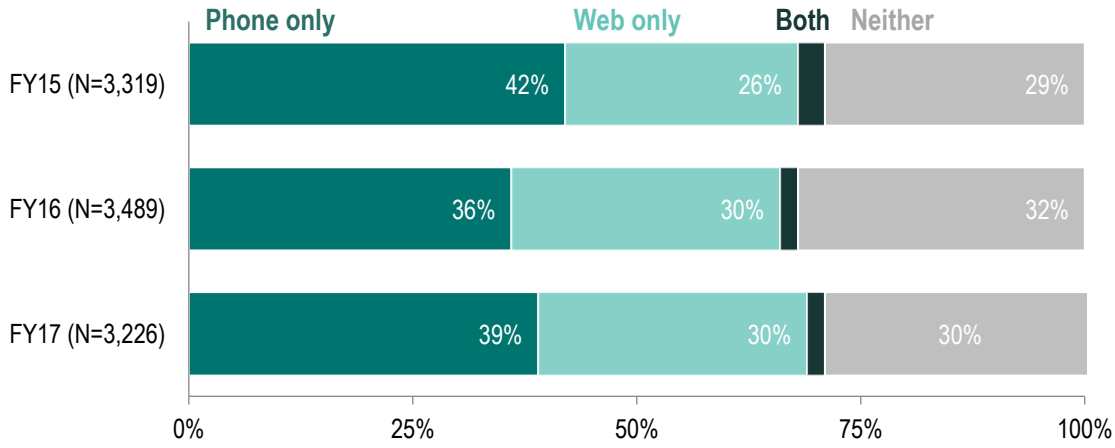
the proportion not using the program, as some of the users currently classified as "not using the program" probably did access the website for at least one day. Related, there were N=176 web only registrants who were missing web utilization but were shipped NRT in the FY. These registrants are classified as web users in this report.

Figure 14: Number of North Dakotans who registered for and used NDQuits services, FY12-FY17



When examining the programs used over time, consistent patterns emerged from FY15 – FY17 (Figure 15). Only about 2-3% of participants used both phone and web consistently over the past three years. While 26% used the web program in FY15, this increased to 30% in FY16 and FY17. While 42% used the phone program in FY15, this decreased to 36% in FY16 and increased slightly to 39% in FY17. Lastly, about 30% of registrants did not go on to use any program in FY15-FY17.

Figure 15: Program used by fiscal year

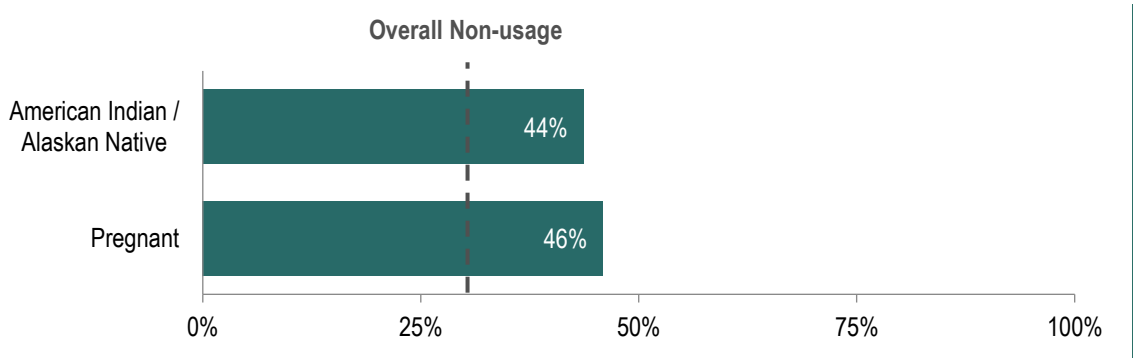


In general, people who register for the phone tend to use the phone program (or no program), while people who register for the web program tend to use the web program (or no program) – cross-over (e.g., people who register for phone and then use web and vice-versa) is very low at 1% or less in FY15-FY17. The percentage of people who register for a program and then do not use any program is consistent about 30% over time and across registration types (phone or web).

AI/AN and pregnant women had higher rates of non-usage than the overall average in FY17

While program non-usage is similar across programs, it is greater among American Indians/Alaskan Natives (44%) and pregnant women (46%) (see Figure 16). If NDDoH is interested in increasing program usage among priority populations, it may be helpful to conduct an ad hoc study (e.g., qualitative interviews with American Indian/Alaskan Native and pregnant female non-users) to further explore reasons for not using the NDQuits program after registration. In addition, PDA continues to recommend investigating reasons for non-usage among both phone and web registrants, as non-usage does not seem to be tied to a specific type of registration (phone or web).

Figure 16: Program non-usage by priority populations in FY17 compared to overall non-usage



❺ What were patterns of NRT provision & use for NDQuits participants in FY17?

Section 5 presents two types of data:

1) **Intake/utilization data.** Analyses were done not at the individual tobacco user level, but at the enrollment level. This process is used to describe the typical experience within a single enrollment.

2) **Follow-up survey respondent data.** Survey data provide respondents' self-reported use of cessation medication and use of other types of cessation support.

Key findings:

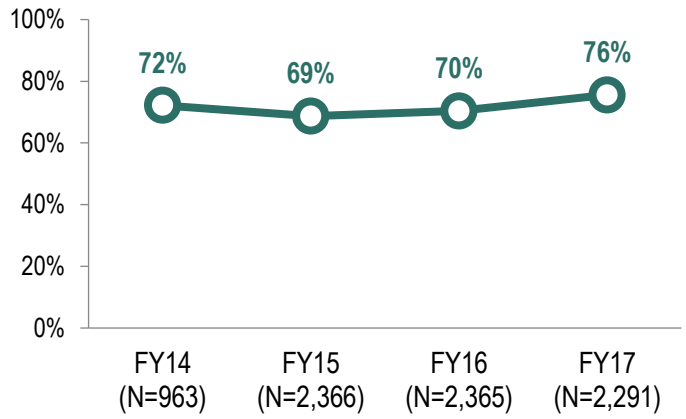
- Nearly 76% of participants who received a call or logged into the web program in FY17 ordered NRT (1732 out of 2291).
- Less than two in 10 participants who were shipped NRT received more than one shipment in FY17 (295 out of 1732).
- Most participants who ordered NRT ordered patches.
- About one in ten users ordered combination NRT (234 out of 2291).
- Majority of participants expected to receive free NRT (475 out of 641).

In North Dakota, 8 weeks of NRT is available for tobacco users who are uninsured or underinsured (e.g., a private insurance plan that does not cover cessation medications). Individuals insured through Medicaid may get additional NRT coverage beyond the 8 weeks, if needed. Interested enrollees may select either a single type of NRT (gum, patch, lozenge) or combination NRT. NRT is provided in 4-week batches and participants can receive two, 4-week shipments of NRT every six months. Participants need to specifically request their second shipment of NRT, which can be done by phone or online.

About 3 in 4 participants who received a call or logged into the web program were shipped NRT

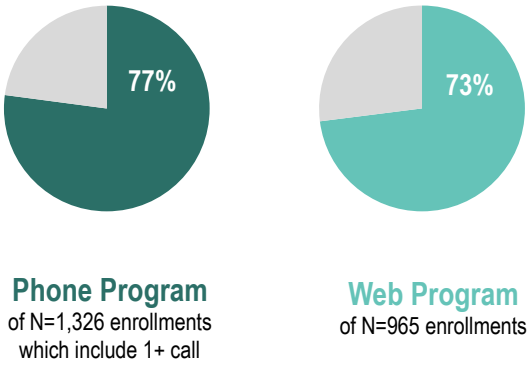
As shown in Figure 17, nearly 76% of phone and web participants who received a call or logged into the web program in FY17 (1732 out of 2291) were recorded as having received at least one shipment of NRT. This is similar to the past three years.

Figure 17: Percent of enrollees shipped NRT by fiscal year



Also, similar to past fiscal years, about 3 in 4 phone participants with or without web who received a call were provided with NRT. The web program, on the other hand, saw a significant increase in the proportion of participants who logged in and then went on to receive NRT, from 59% in FY16 to 73% in FY17 ($\chi^2(1) = 43.84$, $p<.0001$).

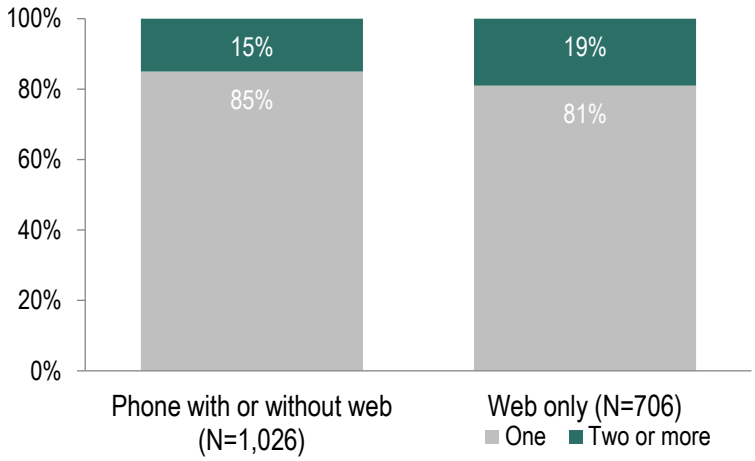
Figure 18: Proportion of enrollees receiving NRT, by program used



Less than 2 in 10 participants who received NRT were shipped more than one shipment in FY17

We see in Figure 19, that among those who were shipped NRT, web program participants were more likely to receive more than one shipment (19% of web participants who got NRT were sent more than one shipment versus only 15% of phone participants).

Figure 19. Number of NRT shipments[11] by Type of Program Used for FY17



The relatively low proportion of participants receiving two shipments of NRT in FY17 continues to be a potential area for improvement (similar to FY14-FY16), since in FY13 those that received two shipments of NRT had higher 30-day abstinence rates at 7-month follow-up than those that had received only one or no shipments. One potential issue may have been that users may not have understood how to obtain a second batch of NRT through NDQuits or that web participants had problems ordering more NRT through the NJH website. PDA recommends potentially engaging NJH to send an email or text reminder to web participants about the possibility of ordering a second shipment. A more in-depth investigation of service delivery may also help shed light into why there is a lower percentage of users receiving more than one NRT shipment than FY16.

Most participants who were shipped NRT were shipped patches only, and about one in ten users were shipped combination NRT

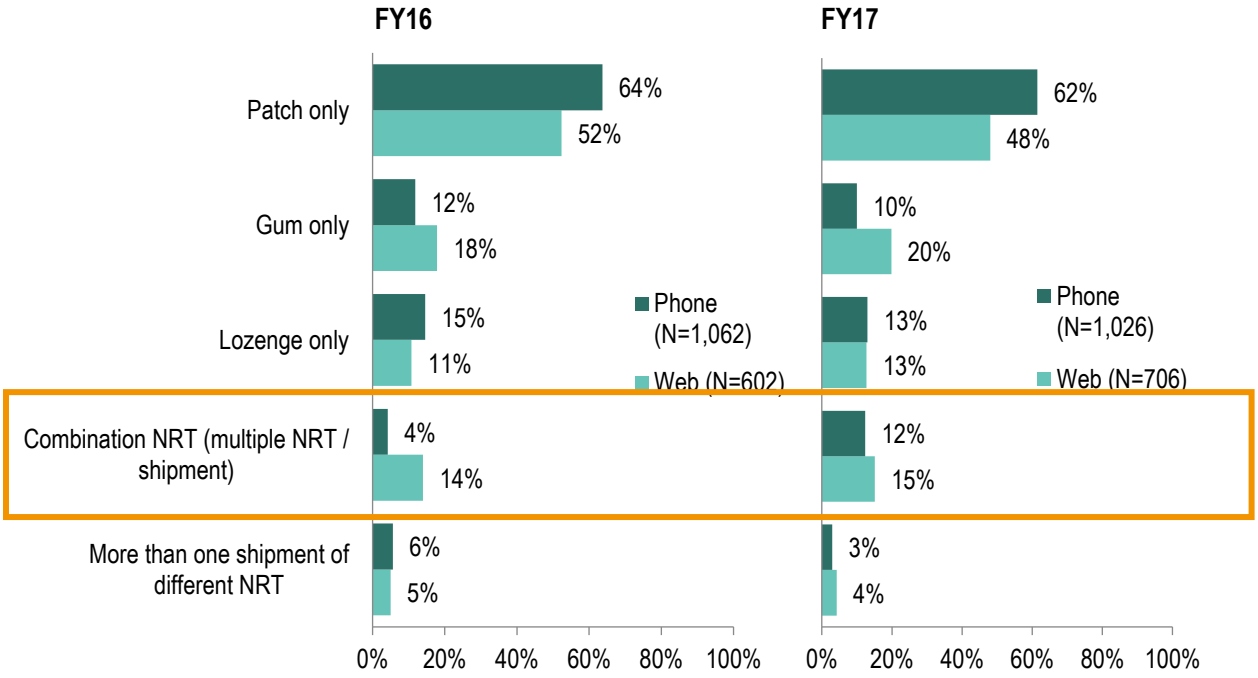
Figure 25 indicates the types of NRT shipped by program used for enrollees who were shipped NRT in FY17. Similar to FY15 and FY16, differences were seen between phone and web participants in terms of the types of NRT shipped. While participants in both programs were most likely to be shipped patches only (62% for phone [down from 64% in FY16], 48% for web [down from 52% in FY16]), web program participants were more likely than phone participants to be shipped gum only in FY17 (20% for web, 10% for phone). Rates of lozenges only were similar for phone program participants and web program participants (13% vs. 13%). The rates

[11] Same day shipments were counted as one shipment.

of being shipped one form of NRT followed by another shipment of a different type remained low for both programs.

Combination NRT use has been found to boost quitting success, which is why NDQuits began offering two types of NRT in a single shipment beginning in October of 2013. Rates of combination NRT shipments were low in previous fiscal years, but per Figure 20, we see that the rates of combination NRT shipments increased among phone participants from 4% in FY16 to 12% in FY17. The percent of phone participants who receive combination NRT is now similar to the percent of web participants who receive it (15%), though overall both rates are still low.

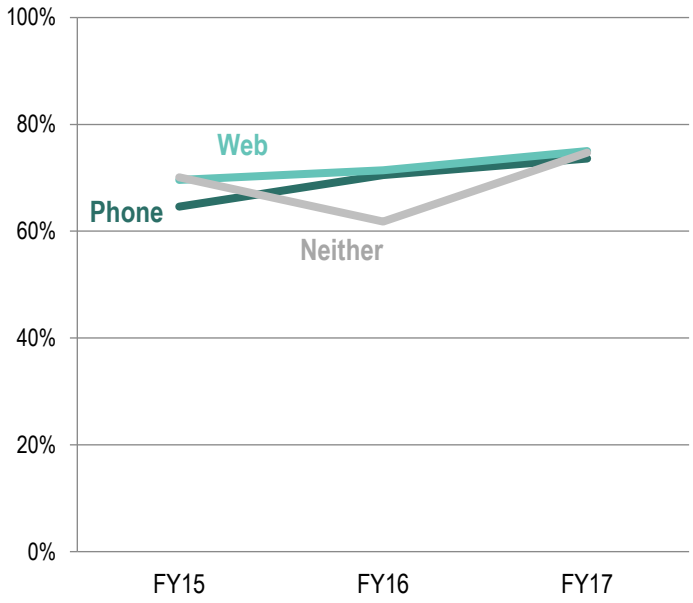
Figure 20. Types of medications shipped by program used in the past two years



Nearly 3 in 4 NDQuits follow-up respondents expected to receive free NRT

Individuals who completed the follow-up survey were asked what expectations they had for receiving NRT when they reached out to NDQuits. Across all respondents (even those who registered for but did not go on to use the NDQuits program), about 3 in 4 respondents indicated they did expect to receive free NRT. The proportion of non-users who expected to receive free NRT increased from FY16 to FY17 (Figure 21).

Figure 21: Proportion expecting free NRT in FY17 by program used



❻ What were the program quit outcomes for FY17?

The focus of this section is on the impact of NDQuits participation on North Dakotans' ability to quit tobacco, including 30-day point prevalence abstinence and 24-hour quit attempts. There are two primary data sources for this section:

1. The FY17 follow-up dataset, which includes enrollments from December 2015 – November 2016 who were followed up between July 2016 – June 2017. Since participant outcomes were measured seven months following enrollment, there was a lag before quit rates could be produced. There were 636 participants who responded to the follow-up survey and were included in this dataset. All these participants are also included in the combined FY14 – FY17 dataset.
2. Combined FY14 – FY17 dataset that includes all NDQuits participants who received a follow-up survey from July 2015 – June 2017. There were 2,784 respondents in this dataset.

The 30-day quit rate is one measure of the success of program participants. As survey respondents are a subset of participants and the results are applied to the entire group of NDQuits users, PDA conducted analyses to determine the generalizability of the survey data, and the extent to which the survey respondents accurately represent all participants. As NJH did not ask for consent at intake for all registrants during FY17, we were unable to assess overall consent rates (NAQC recommends an 85% consent rate).

Key findings

- The overall basic responder quit rate for FY17 was 36.9%. This meets NAQC's recommended 30% benchmark, but the response rate was only 22.6%, so the quit rate should be interpreted with caution.
- Quit rates for priority populations were strong (FY14-FY17 combined) relative to the overall quit rate, but again should be interpreted with caution due to low response rates.
- The standard NAQC quit rate for FY14-FY17 combined was 32.4%, again meeting NAQC's benchmark; with low response rates over time, this finding should also be interpreted with caution.
- Compared to neighboring states, in FY16 North Dakota had a strong quit rate, but should be interpreted with caution as other states target different populations and provide different services.
- The 24-hour quit rates for those that used the phone and the web program remained strong at 92% and 87%, respectively.

Note: Between FY16 and FY17, PDA changed how to define "program". In FY16, PDA reported outcomes defining program as program used (e.g., phone program users would never have zero calls, because you must have at least one call to be categorized in the phone group). In FY17, outcomes are reported by defining program as program registered for (so that some people in the phone group will have zero phone calls). This is in alignment with NAQC best practices that attributes quit rates to the program requested at time of registration regardless of what services was received from registration to 7-months post registration.

This change will lead to differences in quit rates by program, as the FY17 quit rate for web registrants now also includes web users who also used the phone program; therefore, quit rates by program should not be compared from FY16 to FY17. The overall quit rates are comparable.

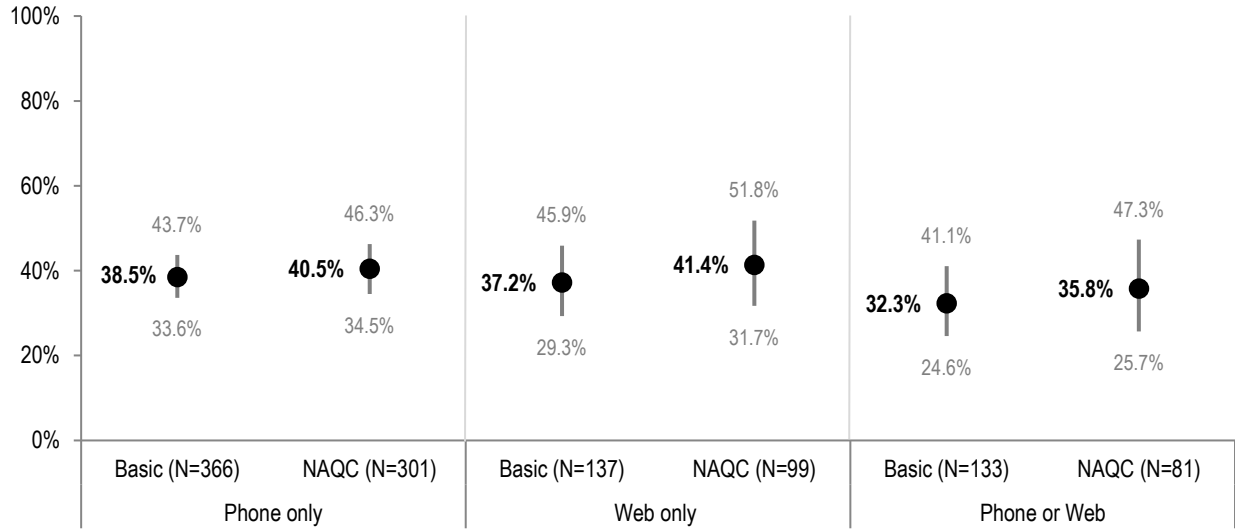
While the FY17 basic overall quit rate increased to 36.9%, the response rate decreased to 22.6%, so the quit rate should be interpreted with caution

Basic 30-day abstinence (FY17 follow-up only)

The primary measure of program success is the percent of participants who report being abstinent from tobacco for 30 days or longer at the time of the follow-up survey, seven months after enrollment ("30-day point prevalence abstinence" or "30-day quit rate"). PDA calculated the overall quit rate for FY17 participants (December 2015 – November 2016 enrollments who were followed up in July 2016 – June 2017) as well as the quit rate by program registered for (see Figure 22).

The basic overall responder quit rate for FY17 was 36.9% (95% confidence interval [CI] of 33.2% - 40.7%). This basic quit rate increased from FY16 (29.6%, 95% CI: 26.5% - 32.9%); however, such a drastic increase without a major program change should be treated and reported with caution. In Section 9, PDA investigates this jump in quit rates and finds that the survey responders from FY17 were a more homogeneous group of people, potentially leading to bias in the quit rate. PDA found that tobacco users who were more affluent (with higher education levels and more private insurance), less addicted to tobacco at intake (less frequent cigarette use, fewer cigarettes smoked per day, longer time after waking before smoking), and who had more intense use of NDQuits (fewer web only registrations, more combination NRT shipments) were overrepresented among survey respondents in FY17. This overrepresentation has the potential to bias quit outcomes upwards. See Section 9 and Appendix 5 for more details on survey respondent representiveness of all NDQuits program registrants.

Figure 22: Overall 30-day basic quit rates by program registered for FY17 survey respondents



When looking at quit rates by program registered for, all programs have strong quit rates. Those who registered for the phone program only have the highest quit rates in FY17 at 38.5%, while those who registered for both phone and web have a quit rate of 32.3% (not statistically significant). Again, quit rates should be interpreted with caution as the issues identified in the quit rate investigation apply here as well.

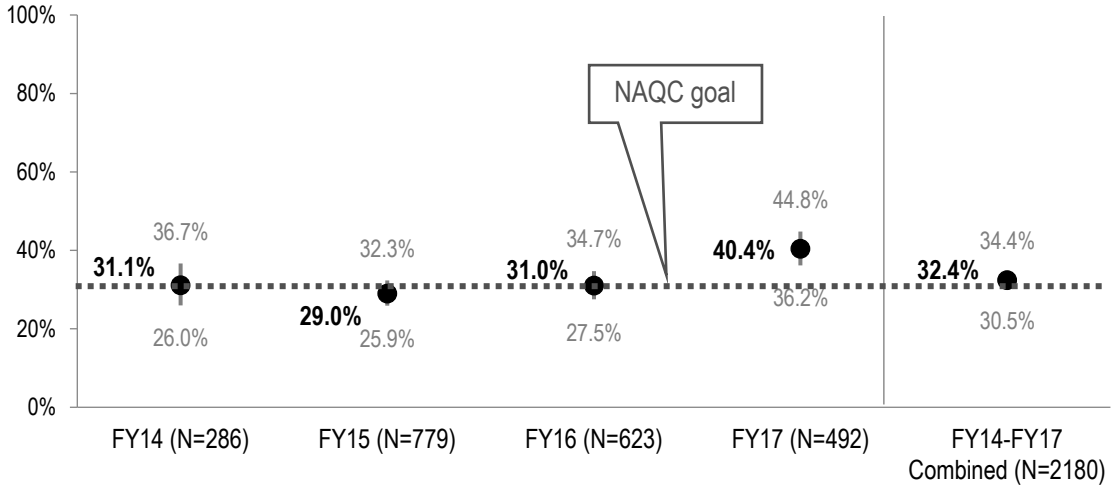
An alternate way of calculating the quit rate is the intent-to-treat (ITT) 30-day abstinence rate. The ITT rate divides the number of quitters by all those who were sampled, instead of only dividing by the total survey respondents. In the ITT rate, non-responders are assumed to still be smoking. This is a more conservative measure of abstinence. The 30-day point prevalence ITT rate for all enrollees with follow-up data in FY17 is a mere 8.3% (95% CI: 7.4% - 9.4%). This ITT rate is likely an under-estimate of the true quit rate, though it does illustrate the impact of the high non-response rate.

The NAQC quit rate met the 30% goal in FY17 and has remained strong over time

In addition to the basic 30-day quit rate, NAQC has a recommended way of calculating the 30-day abstinence rate. NAQC recommends calculating a single quit rate for both programs (phone and web combined), including participants who received telephone counseling and/or NRT (excluding participants who were quit for 30 days or longer at intake, participants who did not receive any telephone counseling, web-based services, or NRT, and participants who only used the web program with no NRT). The NAQC quit rate for all NDQuits participants with follow-up data from FY14 – FY17 (n=2,180) was 32%. This overall quit rate exceeds NAQC's 30%

benchmark. The quit rates for each fiscal year, except FY15, were above the NAQC recommended 30%. The FY17 quit rate, while higher than other years, does not meet the NAQC recommended 50% response rate. Therefore, the FY17 quit rate should be interpreted with caution.

Figure 23: Standard NAQC 30-day quit rate



NAQC quit rate comparisons to neighboring states

Note that NAQC quit rate comparisons across states should be interpreted with caution, as different programs target and serve different populations, in addition to offering different services. For instance, the South Dakota state quitline offers some participants up to 8 weeks of free Bupropion[12].

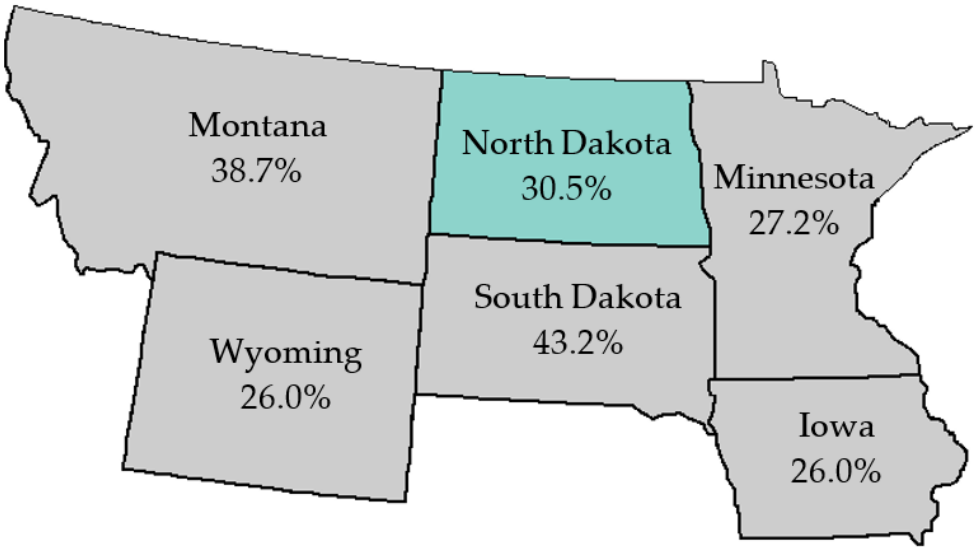
Each year NAQC administers a survey of quitlines in North America to understand quitline operations, services, and outcomes. The most recent year of NAQC data available is FY16. In FY16, the national NAQC quit rate was 30.2% (based on 35 quitlines reporting). North Dakota matched that quit rate at 30.5% for FY16 and exceeded it in FY17.

Additionally, this annual NAQC survey allows comparison of standard NAQC quit rates between neighboring states. For consistency in reporting, all NAQC quit rates in the figure below are from FY16. Compared to neighboring states, North Dakota had a higher quit rate (30.5%) than Wyoming (26.0%), Iowa (26.0%), and Minnesota (27.2%), though a lower quit rate than South Dakota (43.2%) and Montana (38.7%). It should be noted that the quit rates for South

[12] Retrieved from https://www.sdquitline.com/providers/medication-options/.

Dakota and Montana are ranked in the top five highest quit rates in the country[13]. Overall, North Dakota had a strong quit rate in FY16 when compared to neighboring states.

Figure 24: FY16 NAQC quit rates for North Dakota and neighboring states[14]



Quit rates for priority populations were strong

NDDoH was also interested in investigating quit outcomes for priority populations of American Indian/Alaskan Native (AI/AN), LGBT, smokeless tobacco users, pregnant users, and Medicaid users. NAQC recommends that at least 75 survey responses are obtained prior to reporting subgroup quit rates. To increase the amount of data going into the quit rates and obtain more accurate estimates of the quit rates, data from FY14 – FY17 were combined. For each priority population, the basic and NAQC 30-day quit rates are presented. It should be noted that even with combining multiple years of data, there were only 21 pregnant women who responded to the follow-up survey. This does not meet NAQC's recommendation, and therefore the quit rate for that population is not reported.

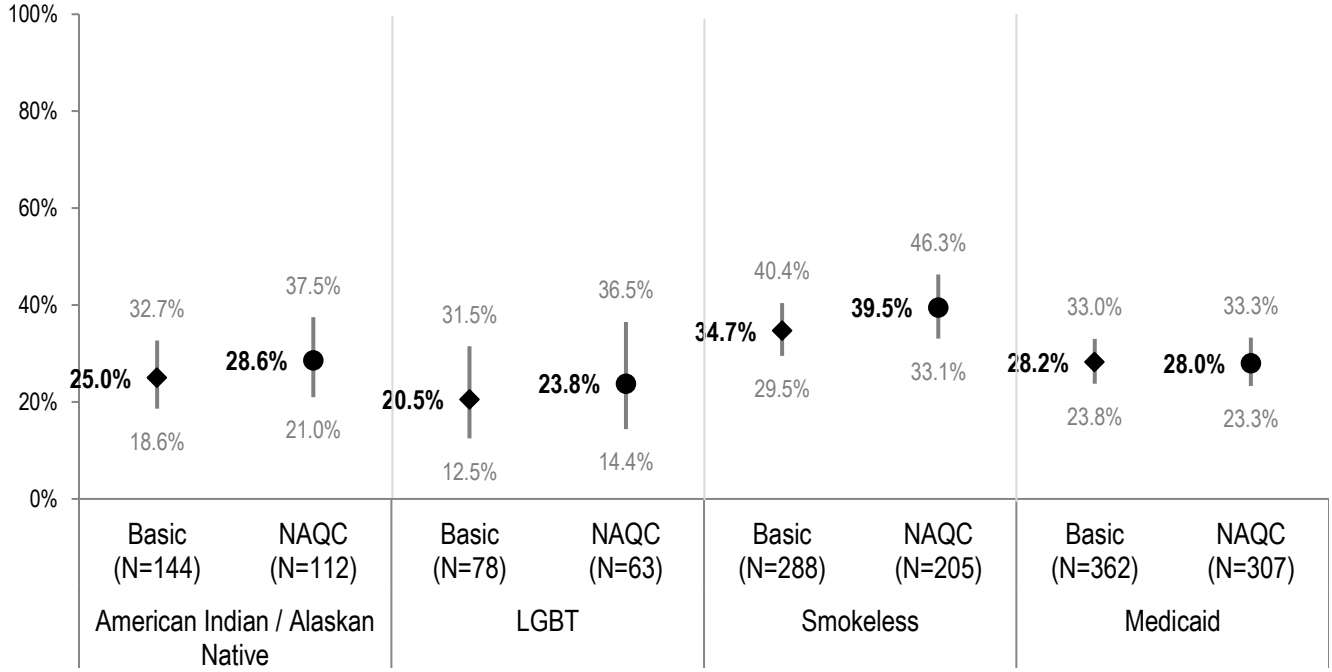
Quit rates for the AI/AN and Medicaid populations almost met NAQC's recommended 30% while those using smokeless tobacco exceeded NAQC's recommendation. The quit rate for LGBT was calculated using 63 responses, which was just under the NAQC recommended 75 responses, so this quit rate should be treated with caution. It should be noted that the FY14 and FY15 data had large amounts of missing sexual orientation data from the web program, so those

[13] North American Quitline Association. (2017). Results from the FY 2016 NAQC Annual Survey of Quitlines. Retrieved from http://c.ymcdn.com/sites/www.naquitline.org/resource/resmgr/2015_survey/ NAQC_FY2016_Annual_Survey.pdf.

[14] North American Quitline Consortium. (2017). *NAQC United States map*. Retrieved from http://map.naquitline.org/.

years were likely underrepresented. Nonetheless, it seems that this priority population fell short of the NAQC recommended 30% quit rate. Overall, the quit rates for these priority populations were strong.

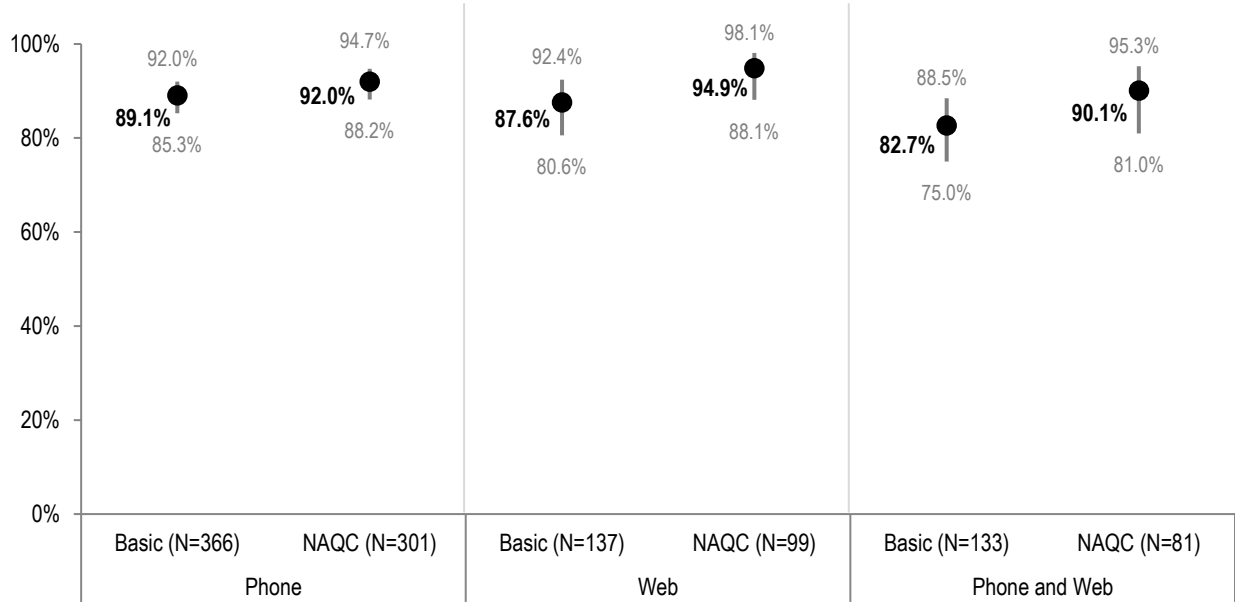
Figure 25: Overall and NAQC 30-day point prevalence abstinence rates for all survey respondents since FY14 by priority population



24-hour abstinence (FY17 participants only) was strong at 87.4%

PDA also calculated the 24-hour abstinence rate (defined as the percent of respondents who reported abstinence from tobacco for a 24-hour period within the previous 7 months) for those with follow-up data in FY17. This is an important first step in the quitting process even if a participant is not able to stay quit for good. Based on PDA's experience, 24-hour quit rates between 80% and 90% are considered strong. The overall FY17 24-hour quit rate falls into this range at 87.4% (95% CI: 84.6% - 89.8%). The 24-hour quit rates for all programs at registration were strong with rates between 83% and 89%.

Figure 26: 24-hour abstinence rates for FY17 survey participants by program registered for



❼ What were patterns of ENDS use?

Electronic nicotine delivery systems (ENDS) are often used in combination with conventional cigarettes. A survey of U.S. quitline callers found that nearly one third (31%) reported using or trying ENDS, and the most common reason for use was to help with quitting other tobacco.[15] However, a recent meta-analysis found that ENDS use is associated with less quitting among smokers.[16] For these reasons, it is important for the evaluation to monitor trends related to ENDS use among NDQuits cessation program participants. PDA examined if and how ENDS use impacted quit outcomes for respondents using participants with follow-up data since FY14.

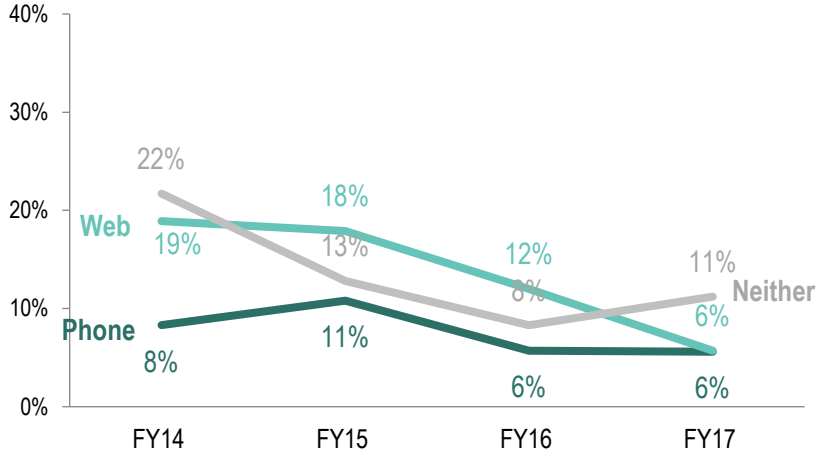
Key findings:

- Web program users were more likely to use ENDS than phone program users (FY14-FY17 combined, 13% vs. 9% respectively).
- ENDS use has trended downward over time.
- The ENDS adjusted quit rate is similar to the basic quit rate.

Overall, the percent of current ENDS users at follow-up has decreased since FY14, particularly among web users

Overall, the percent of responders reporting ENDS use in the past 30 days at follow-up decreased from 12.7% in FY14 to 6.5% in FY17 (Figure 27). This decrease was particularly evident among web users and those who did not use either the phone or web program. The percent of phone users who are current ENDS users at follow-up has remained stable over time.

Figure 27. ENDS use prevalence at follow-up, by program received

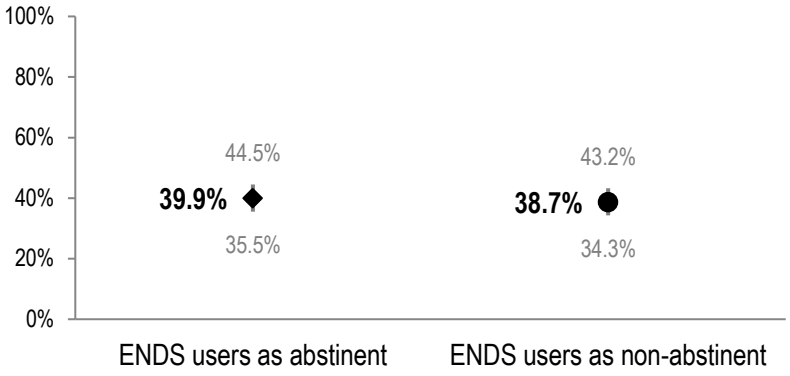


[15] Vickerman K, et al. Use of Electronic Cigarettes Among State Tobacco Cessation Quitline Callers; Nicotine Tob Res (2013) doi: 10.1093/ntr/ntt061 First published online: May 8, 2013. http://ntr.oxfordjournals.org/content/early/2013/05/07/ntr.ntt061.abstract.

[16] Kalkhoran, S., & Glantz, S. A. (2016). E-cigarettes and smoking cessation in real-world and clinical settings: a systematic review and meta-analysis. The Lancet. Respiratory Medicine, 4(2), 116–128. http://doi.org/10.1016/S2213-2600(15)00521-4.

ENDS use at follow-up did not change the FY17 quit rate significantly

Figure 28: Overall NAQC 30-day quit rate (FY17 survey respondents) with and without ENDS use (n=636)



The 30-day abstinence rate previously reported did not factor in current ENDS users at follow-up. Thus, those who were using only ENDS at follow-up (<1% of all respondents) were considered abstinent in the 40.4% 30-day abstinence rate for the program overall. However, if we were to consider ENDS users to be non-abstinent, we can see from Figure 28 that the 30-day point prevalence abstinence rate would drop slightly to 38.7%.

In FY17, a majority of survey respondents reported using ENDS to help them quit and reduce their use of tobacco (83% and 85%, respectively, which is similar to FY16). Other popular reasons for using ENDS included because they seemed safer than cigarettes (41%) and to save money (40%). PDA recommends continuing to monitor ENDS use and its impact on quitting.

❽ To what extent were participants satisfied with the services received in FY17?

This section reports on participants' satisfaction with the services they received, as reported seven months post enrollment. This section also includes the reported helpfulness of various services. Data are derived from seven-month follow-up survey data gathered from July 2016 to June 2017 for participants who enrolled from December 2015 to November 2016. Some categories have been combined in this section (e.g. "very" with "mostly" satisfied and "somewhat" with "not at all" satisfied). The three evaluation questions explored in this section are: 1) to what extent are participants satisfied, 2) how helpful were the program components, and 3) how does satisfaction differ by the amount of the program used?

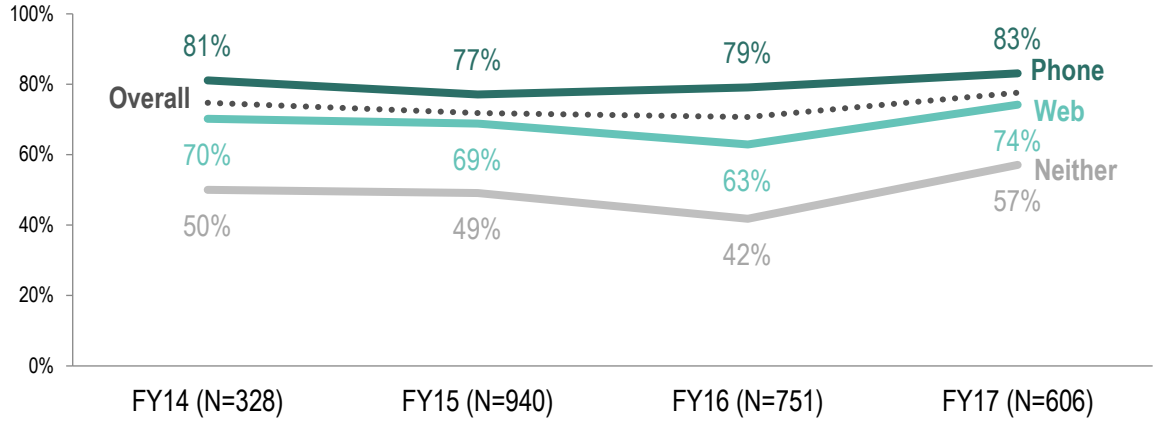
Key findings:

- Satisfaction with NDQuits continues to be high.
- Participants who received evidence-based treatment or logged in 3+ days had greater levels of satisfaction.

Satisfaction was higher for phone participants than web participants

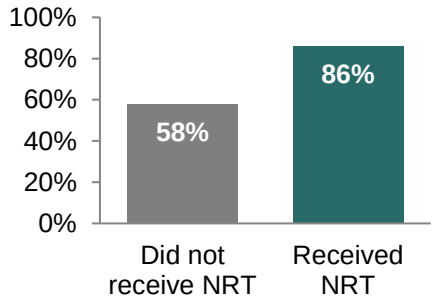
An important measure for cessation programs is the extent to which participants are satisfied with the services they received, because satisfied respondents may be more likely to promote the program to their family or friends who use tobacco. PDA typically considers a program to be successful if 80% or more of respondents being very or mostly satisfied with the services they received. Overall, 78% of FY17 responders (470 out of 606) were satisfied with the program, which is near the 80% goal. Not surprisingly, satisfaction differed by program received. Program satisfaction was highest among phone participants (83%, 324 out of 390) and lower among web participants (74%, 98 out of 132) and those who used neither the phone or web program (57%, 48 out of 84). In our experience evaluating similar programs, it is typical for less intensive programs to achieve lower levels of satisfaction. It is important to note though that satisfaction was highest across all programs compared to the past several fiscal years.

Figure 29: Percent of participants who were "very" or "mostly" satisfied with the service they received from NDQuits, by program received



Participants who received evidence-based treatment (ordered NRT or 3+ counseling calls) reported greater levels of satisfaction

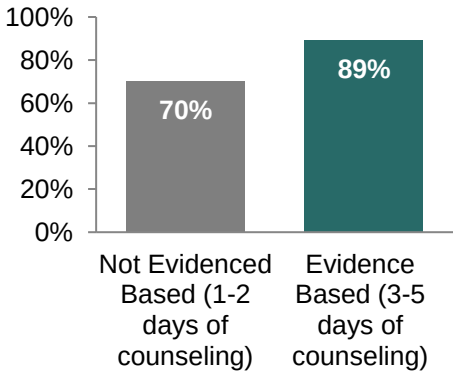
Figure 30: Percent of participants that were very or mostly satisfied by NRT



In FY17, of the 423 participants who received NRT and completed the follow-up survey, 86% reported they were very or mostly satisfied (364 participants; see Figure 30), while 58% of participants who did not receive NRT reported they were very or mostly satisfied (103/183).

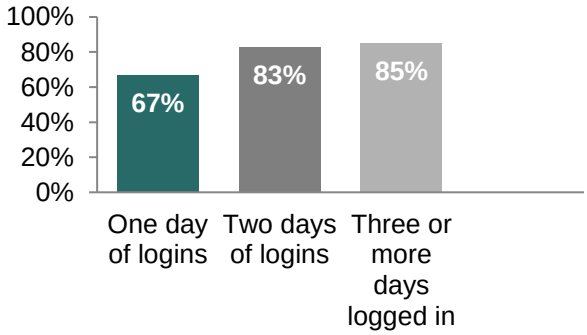
Phone program participants received 1-5+ days of counseling in FY17. Evidence based treatment is three or more days of counseling, and in FY17 satisfaction was linked to evidence-based treatment. Satisfaction among follow-up phone participants remained high in FY17, as, of the 122 participants who received only 1-2 days of counseling, 85 (70%) reported being very or mostly satisfied. Satisfaction increased with more days of counseling; of the 239 people who received 3-5+ days of counseling, 89% were very or mostly satisfied.

Figure 31: Percent of phone participants who said they were very or mostly satisfied, by amount of counseling received



Participants who logged in 3+ days had higher satisfaction than those that logged in 2 or less days

Figure 32: Percent of phone participants who said they were very or mostly satisfied, by amount of counseling received



All web users who were surveyed at follow-up (132) used the web program 1-3+ days. Of the 76 who logged in only one day, 51 (67%) were very or mostly satisfied, while 83% of users who logged in 2 days in FY17 were very or mostly satisfied (24 out of 29). A similar percentage (85%, 23 out of 27) of respondents who used the web program three or more days were very or mostly satisfied.

❾ What was predictive of quitting overall?

Key findings

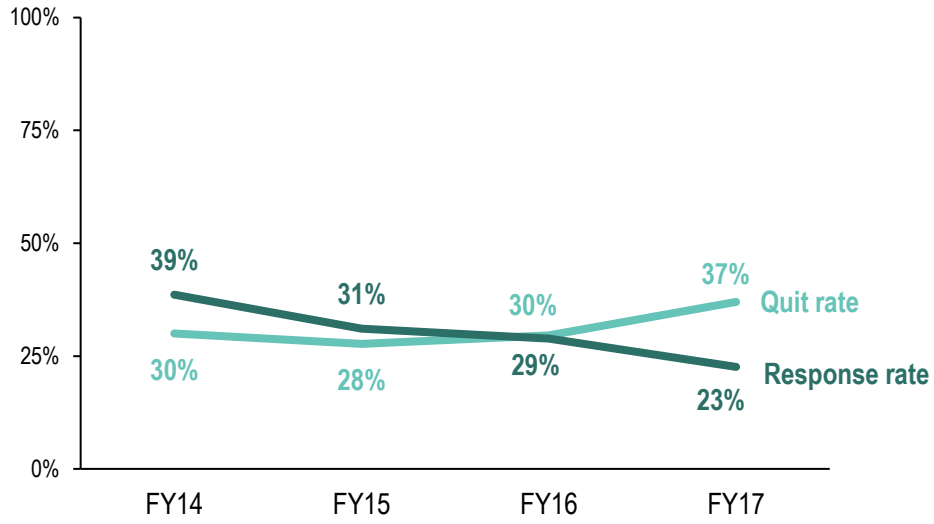
- Before attempting a regression model to determine factors predictive of quitting, the FY17 quit rate was investigated. It was found that decreasing response rates were related to increasing quit rates; there were demographic and clinical differences between survey responders and non-responders; over time, survey respondents were more likely to have characteristics associated with quitting.
- There were large amounts of missing data for those who registered for the web program, so web data had to be omitted from the regression model.
- A preliminary regression model gave some insight to factors related to overall quitting. However, due to the quit rate investigation results and the large amount of missing web data, PDA recommends strengthening data quality, as well as reassessing the survey protocols and increasing the response rate so that a more robust analysis with reliable results can happen in the future.

NDDoH offers a variety of tobacco cessation services to accommodate the diverse population of tobacco users in North Dakota. Various factors influence both the type of service chosen and the 30-day abstinence rates. Logistic regression models can determine the impact that NDQuits has on quit rates while controlling for key demographics, tobacco use characteristics, and other supports. Using all survey responders from the FY14-FY17 outcomes dataset, PDA attempted to calculate regression models predicting the basic 30-day point prevalence abstinence rate.

While the quit rate has increased over time, the response rate has decreased

After discovering the high quit rate in FY17 compared to the previous years, PDA undertook an investigation to see how representative the FY17 data were. First, we examined the quit rate for each fiscal year compared to the response rate (see Figure 34). The correlation between these two rates is -0.70, indicating that as response rate decreased, the quit rate increased. This trend is pronounced when we look at these rates by month – the months with response rates under 30% show much higher quit rates with higher variability compared to those months with response rates over 30%. This relationship indicates the higher quit rate in FY17 might be biased upwards because of the very low response rate (22.6%).

Figure 33: Comparison of response rates to quit rates over time



To continue investigating this trend, PDA conducted a response bias analysis, looking for differences in demographic and clinical characteristics between those who responded to the survey and those who did not. The full results can be found in Appendix 4. Briefly, survey responders in FY17 were more likely to be older at intake, have a higher education level, be insured, and to use their first cigarette later after waking. These variables have also been found to be associated with higher levels of quitting[17,18,19], meaning the FY17 quit rate could be biased upwards since a greater proportion of these groups of tobacco users were among survey responders compared to all program participants.

As a further step of investigation, PDA compared the characteristics of survey responders over time. The main findings are in Table 2. From FY14 – FY17, there were many trends in respondent characteristics that were observed, which would also impact quit rates. For instance, from FY14 to FY17, the rate of web only registration dropped from 30% to 23%. Typically, web programs have lower quit rates than phone programs, so fewer respondents from the web program would lead to an increase in quit rates[20]. Similarly, the percent of responders with

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[17] Lee, C., & Kahende, J. (2007). Factors associated with successful smoking cessation in the United States, 2000. *American Journal of Public Health, 97*(8), 1503-1509.

[18] Bailey, S. R., Hoopes, M. J., Marino, M., Heintzman, J., O'Malley, J. P., Hatch, B., . . . DeVoe, J. E. (2016). Effect of gaining insurance coverage on smoking cessation in community health centers: A cohort study. *Journal of General Internal Medicine, 31*(10), 1198-1205.

[19] Kalkhoran, S., Grana, R. A., Neilands, T. B., & Ling, P. M. (2015). Dual use of smokeless tobacco or e-cigarettes with cigarettes and cessation. *American Journal of Health Behaviors, 39*(2), 277-284.

[20] Neri, A. J., Momin, B. R., Thompson, T. D., Kahende, J., Zhang, L., Puckett, M. C., & Stewart, S. L. (2016). Use and effectiveness of quitlines versus web-based tobacco cessation interventions among 4 state tobacco control programs. *Cancer, 122*(7), 1126–1133. doi:10.1002/cncr.29739.

private insurance jumped from 25% in FY14 to 43% in FY17. Typically, those with insurance are more likely to be quit, so this is another characteristic of the FY17 survey responders expected to increase the quit rate.

Taken together, each year the survey respondents seemed to be more affluent (more private insurance, more higher education), be less addicted to tobacco (use fewer cigarettes, use cigarettes later after waking), and received more intense service from NDQuits (less web registration, more combination NRT).

Table 2: Characteristics of survey responders over time that may increase the quit rate

Characteristic	FY14	FY15	FY16	FY17
Age 55+ years	31%	29%	36%	40%
Graduated college	18%	21%	21%	23%
Private insurance	25%	30%	33%	43%
Use cigarettes some days or not at all	5%	7%	10%	9%
Smoke less than 1 pack per day	40%	42%	44%	47%
1st cigarette 5 minutes or more after waking	59%	55%	61%	64%
Phone (with or without web) registration	70%	70%	75%	78%
Combination NRT	2%	4%	5%	9%

Response bias issues and large amounts of missing data for web registrants prevented further analysis of predictors of the basic 30-day point prevalence abstinence

In addition to the response bias issues noted above, an investigation into the variables PDA typically considers as predictors for quit rates revealed a fair number of variables were not available for the web program (see Appendix 6 for full details). Despite the responder bias and the missing data issues, PDA attempted to run a regression model to determine which factors predict 30-day abstinence. The regression model was run for the phone program only for all respondents from FY14 – FY17 with follow-up data.

The preliminary phone model was ran using N=2,046 records. The model explained and fit the data was acceptable with a Nagelkerke R-Square of 13.3% and a non-significant Hosmer and Lemeshow Test ($\chi^2(8)=8.46$, $p=.390$). Of all the factors mentioned above, the only factors to contribute significantly to predicting quit outcomes include year, geographic region, type of tobacco used at intake, overall health status at follow-up, e-cigarette use at follow-up, and

amount of coaching. While these factors are not unexpected, due to the response bias and the missing data issues, PDA feels that these results should be used with caution and have decided not to present the full regression results. Instead, PDA recommends correcting the data issues beginning with a conversation with NJH and NDDoH to prioritize issues, attempting to increase the response rate, and getting follow-up data from a wider variety of participants to have better data for a predictive model in the future. To widen our sample, PDA recommends moving to a 12-month rolling eligibility for the follow-up survey. By including all participants who registered in the past 12 months (instead of only surveying first time registrants), we will likely survey people who are using the program multiple times, which will potentially diversify the follow-up survey sample pool.

Conclusions and Next Steps

In FY17, NDQuits continued to provide **strong, evidence-based programming** to North Dakotan tobacco users. As quitlines remain a strong resource for evidence-based practice and a key component of comprehensive tobacco control, it is important to note the successes of NDQuits. For instance, in FY17, over 62% of FY17 NDQuits registrants received NAQC defined minimal treatment. Of the 35% of NDQuits registrants referred by providers who enrolled, 70% of them received NAQC-defined minimal treatment. In addition, participants who received evidence-based treatment reported greater levels of satisfaction, and overall satisfaction with NDQuits remained high in FY17. ***PDA recommends* that NDQuits continues to provide evidence-based treatment options for NDQuits participants**, strengthening partnerships with grantees (LPHUs, NDQC grantees, BABY & ME) to continue outreach to priority populations.

Yet, important data limitations exist which make it difficult to draw strong conclusions. Most notably:

- **Treatment reach** remains lower than desired, and regions in North Dakota with the highest tobacco use rates had the lowest reach rates in FY17.
    - *PDA recommends* targeting media and program outreach (e.g., work with LPHUs) specifically in regions with the highest tobacco use rates to increase program reach in higher prevalence areas.

- The **overall basic quit rate** for FY17 was 36.9%, meeting NAQC's recommended 30% benchmark. The **24-hour quit rates** for phone and web program users were 92% and 87% respectively. Quit rates for priority populations were also strong. E-cigarette use has been trending downward over time, and e-cigarette use at follow-up did not change the FY17 quit rate significantly.
    - Yet, all results should be ***interpreted with extreme caution***. The response rate in FY17 was only 22%, not meeting NAQC's recommending 50% benchmark. From FY14 – FY17, decreasing response rates were related to increasing quit rates. Over time, survey responders were more likely to be affluent, less addicted to tobacco at intake, and have more intense use of NDQuits, all which are positively associated with quitting. *PDA recommends* monitoring consent at intake to calculate a true response rate and abstinence rate (as NJH started asking for consent at intake in FY18). *PDA also recommends* moving to a 12-month rolling eligibility to attempt

increasing representativeness of our follow-up data.

- PDA attempted to conduct a regression model to **determine the impact of NDQuits** on quit rates while controlling for key variables (demographics, tobacco use, and other supports). Yet, PDA found ***large amounts of missing data*** for web registrants which prevented further analysis of characteristics of predictors of the overall basic quit rate.
    - If time and resources allow, *PDA recommends* working more intensely with NJH to monitor and resolve data issues that restrict analyses and interpretations.

- Lastly, a similar pattern of no utilization emerged in FY17, as **30% of North Dakotans** who completed intake **did not use any NDQuits program**.
    - Depending on NDDoH priorities, time, and resources, *PDA recommends* additional investigations such as delving into why participants do not use the program (such as AI/AN, pregnant females, those on Medicaid, and those who use smokeless tobacco).

While there were no major changes to the quitline or web programs in FY17, the landscape of tobacco control in North Dakota experienced notable shifts at the end of FY17 (as legislature cut funding and closed the Center). As of FY18, NDDoH is now in charge of all components of the North Dakota tobacco prevention and control program, which is a sizable shift from focusing on the cessation programs in FY17. NDDoH has been working collaboratively with partners statewide to develop a new State Plan, which prioritizes activities for the next two years. As NDDoH continues its efforts to reduce tobacco use, it is more important than ever to have reliable, robust data to drive prioritization of strategies given limited resources. Without valid, trustworthy data, NDDoH will be limited in its ability to have an accurate picture of what is and is not working, to ensure resources are adequately directed to maximize impact of the program.

Appendices

1. Data sources, types of data, and survey attrition
2. Methodology
3. Reach calculations
4. Demographic and Tobacco Use Characteristics
5. Follow-up Respondent Representativeness
6. Logistic Regression
7. References

Appendix 1: Data sources, types of data, and survey attrition

Data sources

There are three major groups of participants included in this report:

1. FY14-FY17 outcomes dataset (Dataset 1: All NDQuits participants with intake and follow-up data from FY14 – FY17)
2. FY17 intake dataset (Dataset 2: All NDQuits participants with intake data from FY17 – registrations from July 1, 2016 to June 30, 2017)
3. FY17 outcomes dataset (Dataset 3: Dec 2015 – Nov 2016 enrollments who were followed up in Jul 2016 – Jun 2017)

Types of data

Intake data

NJH provided PDA with individual-level registration extracts for all individuals who enrolled in the telephone and web programs between July 1, 2014 – June 30, 2017 for Dataset 1. Dataset 2 includes all individual-level data from those who registered in the telephone and web programs between July 1, 2016 – June 30, 2017. NJH collects data similar to the Minimal Data Set (MDS) items developed by the North American Quitline Consortium (NAQC), including information on participant demographics, tobacco use characteristics, and quit histories. NJH collects intake data at the time of enrollment or re-enrollment. Once NJH sends the intake data, PDA thoroughly cleans the data and checks for quality assurance. Note that asking consent to follow-up was ***not*** part of the intake process in FY17, but NJH started asking consent in October 2017.

Referral data

NJH tracks all incoming referrals in the Referral Detail Extracts. For analysis, PDA selected those referrals with a referral closed date within FY17 that originated from one of the following referral types: 1) fax referral, 2) E-referral, or 3) provider web referral. To calculate a conversion rate—defined as the proportion who complete intake for NDQuits on or after the referral closure date – PDA tied the Client Data Extract to the Referral Details Extract via PTID, to determine whether an intake record existed for the referral record. Referral records with an intake date on or after the referral date are considered "converted" to intake completion. Conversion is reported out of unique referrals to prevent multiple referrals/enrollments from impacting the conversion rate.

Program use data

NJH tracks enrollees' use of the phone and web programs, including number of calls or log-ins, and provision of NRT. Again, for the FY14-FY17 outcomes dataset (Dataset 1), this includes any enrollees that used a program from July 1, 2014 – June 30, 2017. The FY17 intake dataset (Dataset 2) includes any enrollees that used a program between July 1, 2016 – June 30, 2017.

Table 3: FY17 intake dataset attrition table

	Phone registration	Web registration	Both phone and web registration	Total
Tobacco users requesting services	1,644	1,324	356	3,324
Unique tobacco users requesting services	1,595	1,323	348	3,266
Unique tobacco users receiving NAQC minimal treatment	1,121	680	231	2,032

Follow-up data

Sampling and weighting

PDA's ongoing follow-up survey of NDQuits participants is conducted with an exhaustive sample of eligible participants who enroll each month. By design, the sample mirrors the general population of all participants in terms of the proportion enrolled in each of the three primary programs (see survey attrition table below). Despite the exhaustive sample, response rates differed across programs resulting in a respondent group that overrepresented phone program enrollees and under-represented dual program enrollees. Exploratory analyses were conducted to determine the impact on participant outcomes by weighting the respondent group to more precisely match the census of participants back to program selection at time of enrollment. The results were that quit rates and other outcomes would shift by no more than 0.3 percentage points. As such, the decision was made to use the unweighted dataset.

The follow-up survey includes standard questions developed by NAQC, with additional questions developed by PDA and NDDoH (see Attachment 1 for the full survey instrument). WYSAC administers the survey to all eligible participants as a mixed-mode survey (via web and phone). Those eligible include tobacco users who are: calling for help with quitting or staying quit, age 18+, ND resident, and first time ever NJH program enrollment. As previously stated, PDA exhaustively samples those eligible. Once the sample is chosen, WYSAC mails pre-notification letters (PNLs) to those with valid street or email addresses. Participants with email addresses are then sent a link to a web survey; if they do not respond, they are later contacted by phone. WYSAC calls participants without email addresses after mailing the PNLs. When WYSAC calls to administer the follow-up survey, they first ask participants for their consent (as the first question).

Survey Attrition

There were 5,012 unique enrollments in NDQuits from December 2015 – November 2016. Enrollees were eligible to be sampled if it was their first enrollment, if they were aged 18 years or older, and if they provided a valid phone number or email address. There were 2,817 unique people who met all of these criteria, meaning 56% of all enrollments were eligible to be sampled. NDQuits conducts an exhaustive sample of eligible participants, so all 2,817 eligible were sampled. Of those sampled, only 23% (n=636) responded to the survey. It should be noted that because consent is asked as the first question during the follow-up call, consent rate and responder rate are the same. If consent was asked at enrollment, the responder rate would likely be higher because those who did not consent would not be contacted.

Figure 34: Survey attrition for FY17

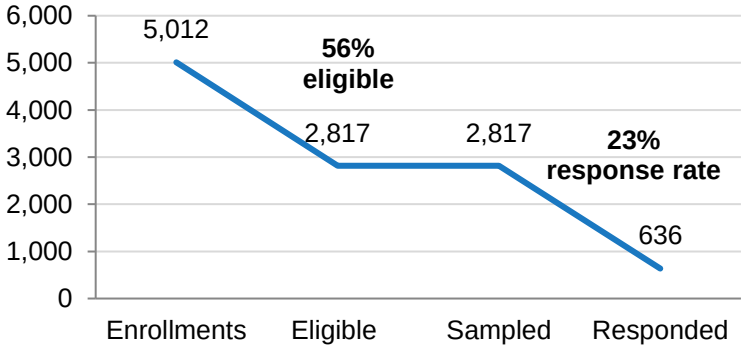

Table 4 presents attrition for the FY14-FY17 intake dataset (Dataset 1).

Table 4: FY14-FY17 follow-up attrition

	Phone registration	Web registration	Both phone and web registration	Total
Total registrations for help quitting or staying quit from tobacco	N/A	N/A	N/A	5,012
All enrollments eligible for follow-up (first time program enrollment, 18 years+, valid phone or email, unique enrollment)	1,282 (45%)	667 (24%)	868 (31%)	2,817 (100%)
Eligible and sampled for follow-up survey	1,282	667	868	2,817
Follow-up survey respondents	355 (57%)	137 (22%)	133 (21%)	625 (100%)

Appendix 2: Methodology

Evaluation Questions

The table below outlines the evaluation questions (developed by PDA and NDDoH) and data sources included in this report.

Table 5: FY17 evaluation questions and data sources

Evaluation Question	Dataset
1. What was the reach of NDQuits in FY17?	FY17 outcomes
2. How did enrollees learn about and connect with NDQuits in FY17? • Number of fax and e-referrals from providers, change over time • Conversion rate from referral to enrollment • Frequency of registrants reporting having seen the CDC Tips campaign	FY17 intake FY17 referral
3. What were the NDQuits participant characteristics in FY17? • How many unique tobacco users registered to receive services through NDQuits in FY17 (and specifically for priority populations)? • Demographics of FY17 intake data and use of tobacco at intake (by priority population, program, type of tobacco used) • Comparison to BRFSS	FY17 intake
4. What were the patterns of use for NDQuits participants in FY17?	FY17 outcomes
5. What were patterns of NRT provision and use in FY17?	FY17 outcomes
6. What were the program quit outcomes for FY17?	FY17 outcomes
7. What were patterns of ENDS use? • What were participants' patterns of E-cig use following program enrollment? • What were the potential implications of E-cig use on 30-day abstinence?	FY14-FY17 FY17 intake FY17 outcomes
8. To what extent were participants satisfied with the services received in FY17?	FY17 outcomes
9. What was predictive of quitting overall? Variables considered: Service utilization, registration mode, demographic characteristics, tobacco use characteristics, use of any stop-smoking medication via follow-up survey, ENDS use at follow-up	FY14-FY17

Appendix 3. Reach calculations

Quitline "reach" refers to the percentage of a state's tobacco-using population that is served by a state's tobacco cessation quitline or quitlines. One type of reach is "treatment reach," a measure of the impact of the quitline. The North American Quitline Consortium (NAQC) defines treatment reach as the "the proportion of the target population who receives an evidence-based treatment from a quitline."[21] NAQC defines the target population as all adult tobacco users and evidence-based treatment as including both telephone counseling and pharmacotherapy. CDC's *Best Practices for Comprehensive Tobacco Control Programs*[22] set as a goal that quitlines should reach 8% of state smokers each year, while, on average, state quitlines only reach about 1% of smokers annually. However, according to data collected by NAQC, in FY09, only 1.2% of tobacco users in the United States received cessation counseling and/or medications through quitlines[23].

PDA created a treatment reach which includes in the numerator those that were cigarette and/or smokeless tobacco users (excludes exclusive pipe, cigar, or other tobacco users) at registration, were over the age of 18, and received at least one phone counseling call, or logged into the website at least once, or received a shipment of NRT[24].

Prevalence data from the 2016 Behavioral Risk Factor Surveillance System (BRFSS) are used for estimates of the number of tobacco users in North Dakota (the denominator in reach calculations). Overall tobacco use prevalence (any tobacco) in North Dakota was 23.9% in 2016, compared to 23.7% in 2015, 24.3% in 2014, 27% in 2013, 25% in 2012, and 28% in 2011. As of 2016, approximately 19.5% of North Dakota adults are current cigarette users, 6.95% are current users of smokeless tobacco, and 2.6% use both cigarettes and smokeless tobacco ("dual users"). Tobacco use prevalence is the highest in the Lake Region (31.2%) and the Northwest region (30.4%). See Tables 6 – Tables 9 for breakout of reach by region and tobacco type.

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[21] North American Quitline Consortium (NAQC). (2009). *Measuring Reach of Quitline Programs. Quality Improvement Initiative* (S. Cummins, PhD). Phoenix, AZ.

[22] Centers for Disease Control and Prevention. (2014). *Best Practices for Comprehensive Tobacco Control Programs—2014.* Atlanta: U.S. Department of Health and Human Services, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

[23] Barry, M.B., Saul, J., & Bailey, L.A. (2010). *US quitlines at the crossroads: Utilization, budget, and service trends 2005-2010.* Phoenix, AR: North American Quitline Consortium.

[24] This differs from the NAQC standard treatment reach rate reported on the NAQC annual survey. The NAQC rate does not include web users that did not receive NRT.

Table 6: FY17 treatment reach to North Dakota tobacco users (cigarettes and/or smokeless tobacco)

Region			Any Tobacco Use (Cigarettes and/or Smokeless)								
	population (2016 Census)	prevalence (2016 BRFSS)	ND Tobacco Users (C*D=E)	Participants (Any Program)	Reach (Any Program)	Quitline Participants	Quitline Reach	QuitLogix Participants	QuitLogix Reach	Dual Program Participants	Dual Program Reach
Statewide	622,181	*23.9%*	*148,701*	2,226	***1.50%***	*1,228*	***0.83%***	*941*	***0.63%***	*57*	***0.04%***
Statewide AI/AN	*31,974*	*50.0%*	*15,987*	136	***0.85%***	*114*	***0.71%***	*22*	***0.14%***	*0*	***0.00%***
Western Service Regions	271,321	26.7%	*72,443*	945	1.30%	511	0.71%	409	0.56%	25	0.03%
Eastern Service Regions	350,860	21.4%	*75,084*	1,279	1.70%	715	0.95%	532	0.71%	32	0.04%
1. Northwest	35,465	30.4%	*10,790*	104	0.96%	56	0.52%	46	0.43%	2	0.02%
2. North Central	77,905	28.6%	*22,315*	298	1.34%	154	0.69%	132	0.59%	12	0.05%
3. Lake Region	70,075	31.2%	*21,844*	102	0.47%	67	0.31%	35	0.16%	0	0.00%
4. North East	72,912	22.1%	*16,096*	319	1.98%	182	1.13%	130	0.81%	7	0.04%
5. South East	163,845	19.1%	*31,322*	661	2.11%	348	1.11%	293	0.94%	20	0.06%
6. South Central	44,028	21.0%	*9,259*	197	2.13%	118	1.27%	74	0.80%	5	0.05%
7. West Central	122,432	24.6%	*30,073*	442	1.47%	241	0.80%	190	0.63%	11	0.04%
8. Badlands	35,519	26.8%	*9,536*	101	1.06%	60	0.63%	41	0.43%	0	0.00%

Table 7: FY17 treatment reach to North Dakota cigarette users (with or without other tobacco)

Region			Cigarette Users (with or without other tob)								
	population (2016 Census)	prevalence (2016 BRFSS)	ND Cigarette Users (C*D=E)	Participants (Any Program)	Reach (Any Program)	Quitline Participants	Quitline Reach	QuitLogix Participants	QuitLogix Reach	Dual Program Participants	Dual Program Reach
Statewide	*622,181*	*19.5%*	*121,325*	2,104	***1.73%***	*1,179*	***0.97%***	*872*	***0.72%***	*53*	***0.04%***
Western Service Regions	271,321	21.0%	*56,977*	886	1.56%	487	0.85%	377	0.66%	22	0.04%
Eastern Service Regions	350,860	18.2%	*63,857*	1,216	1.90%	690	1.08%	495	0.78%	31	0.05%

Table 8: FY17 treatment reach to North Dakota smokeless tobacco users (with or without other tobacco)

Region			Smokeless Users (with or without other tob)								
	population (2016 Census)	prevalence (2016 BRFSS)	ND Smokeless Users (C*D=E)	Participants (Any Program)	Reach (Any Program)	Quitline Participants	Quitline Reach	QuitLogix Participants	QuitLogix Reach	Dual Program Participants	Dual Program Reach
Statewide	*622,181*	*6.95*	*54,068*	242	***0.45%***	*87*	***0.16%***	*147*	***0.27%***	*8*	***0.01%***
Western Service Regions	271,321	*8.7%*	*14,543*	123	0.85%	45	0.31%	73	0.50%	5	0.03%
Eastern Service Regions	350,860	5.4%	*18,806*	119	0.63%	42	0.22%	74	0.39%	3	0.02%

Table 9: FY17 treatment reach to North Dakota dual cigarette and smokeless users

Region			Dual Cigarettes and Smokeless Users								
	population (2016 Census)	prevalence (2016 BRFSS)	ND Both Cigs and Smokeless Users (C*D=E)	Participants (Any Program)	Reach (Any Program)	Quitline Participants	Quitline Reach	QuitLogix Participants	QuitLogix Reach	Dual Program Participants	Dual Program Reach
Statewide	*622,181*	*2.6%*	*16,239*	120	***0.74%***	*38*	***0.23%***	*78*	***0.48%***	*4*	***0.02%***
Western Service Regions	271,321	3.1%	*8,302*	64	0.77%	21	0.25%	41	0.49%	2	0.02%
Eastern Service Regions	350,860	2.2%	*7,684*	56	0.73%	17	0.22%	37	0.48%	2	0.03%

Appendix 4. Demographic and Tobacco Use Characteristics

Details are included in this Appendix about demographic and tobacco use characteristics for the FY17 registrants by program used (phone with or without web, email, and text, web with or without email, or neither phone nor web with or without email and text), overall, and for North Dakotan residents. A total of 3,266 unique tobacco users registered for the phone and web programs in FY17, while only 1,325 unique tobacco users went on to use the phone program, and 959 used the web program. Data was collected from 5,465 North Dakota tobacco users in 2016 (2016 ND BRFSS).

PDA examined intake data from all NDQuits registrants using the FY17 intake dataset to explore the demographic and tobacco use characteristics of FY17 NDQuits registrants. PDA first compared demographic characteristics for phone users, web users and North Dakotans who registered for NDQuits but did not use neither the phone nor the web program. PDA also compared demographic characteristics for NDQuits registrants overall to North Dakotan tobacco users statewide (ND BRFSS 2016 data). The table below details the complete data for all program registrants' demographic characteristics by program used, overall, and in comparison to North Dakotan tobacco users statewide. In addition, key highlights are summarized below.

Table 10: Demographic characteristics of FY17 program enrollees (N=3,266) and North Dakota tobacco users (BRFSS 2016)

		Phone (n= max is 1,326)		**Web** (n= max is 965)		**Neither phone nor web** (n=max is 975)		**Overall** (n=max is 3,266)		**BRFSS 2016** (n=max is 1,330)	
Variable	Value	n	%	n	%	n	%	n	%	n	%
Gender	Male	570	43.0%	406	42.3%	340	39.6%	1316	41.9%	858	64.5%
(missing n=123)	Female	755	57.0%	553	57.7%	519	60.4%	1827	58.1%	472	35.5%
Age at enrollment	18-24	72	5.4%	147	15.3%	103	10.6%	322	9.9%	236	17.7%
(missing n=10)	25-34	247	18.6%	375	39.1%	273	28.1%	895	27.5%	310	23.3%

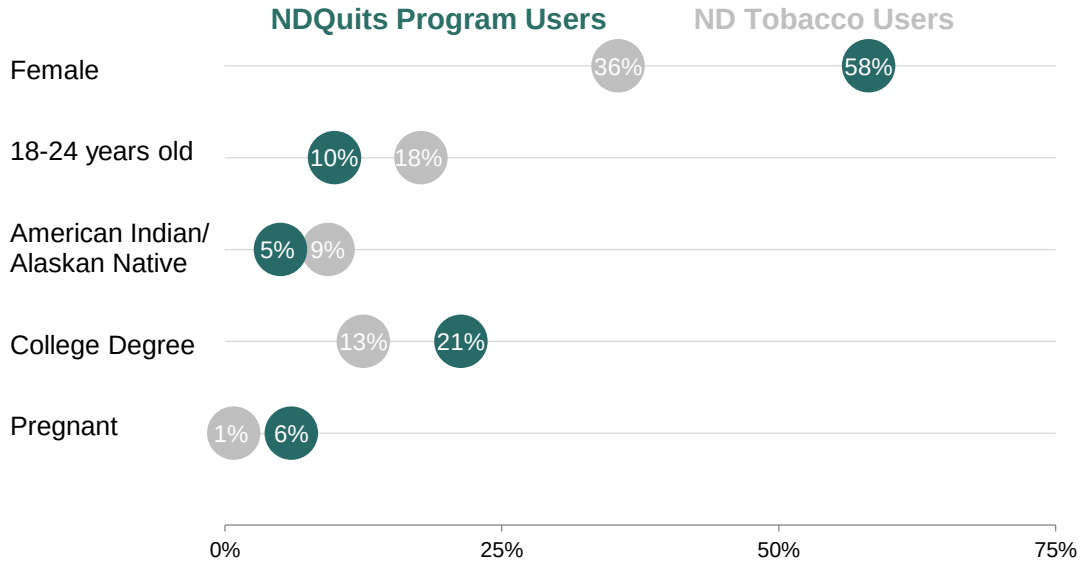
	35-44	210	15.8%	236	24.6%	200	20.6%	646	19.8%	234	17.6%
	45-54	274	20.7%	120	12.5%	192	19.7%	586	18.0%	225	16.9%
	55-64	337	25.4%	63	6.6%	151	15.5%	551	16.9%	198	14.9%
	65+	185	14.0%	17	1.8%	54	5.5%	256	7.9%	128	9.6%
Race (missing n=110)	White	1108	85.3%	881	95.3%	795	85.2%	2784	88.2%	1121	85.1%
	Black or African American	37	2.8%	13	1.4%	17	1.8%	67	2.1%	40	3.0%
	American Indian/ Alaska Native	70	5.4%	19	2.1%	69	7.4%	158	5.0%	122	9.3%
	Some other race/ Multiple races	84	6.5%	11	1.2%	52	5.6%	147	4.7%	34	2.6%
Hispanic (missing n=322)	Yes	34	2.6%	10	1.3%	24	2.9%	68	2.3%	18	1.8%
Education (missing n=39)	Did not graduate high school	163	12.4%	39	4.1%	104	10.8%	306	9.5%	178	13.4%
	High school or GED	503	38.2%	302	31.7%	351	36.6%	1156	35.8%	496	37.3%
	Some college or trade school	409	31.1%	354	37.2%	315	32.8%	1078	33.4%	490	36.8%
	College/ university degree or higher	241	18.3%	257	27.0%	189	19.7%	687	21.3%	166	12.5%
Insurance type* (missing n=15)	Private insurance	580	43.9%	437	45.4%	437	45.1%	1454	44.7%	*1120	*84.6%
	Medicaid	304	23.0%	95	9.9%	158	16.3%	557	17.1%		
	Medicare	287	21.7%	21	2.2%	93	9.6%	401	12.3%		
	Uninsured/Other	149	11.3%	410	42.6%	280	28.9%	839	25.8%		
Sexual orientation (missing n=15)	Heterosexual	1282	96.7%	916	95.3%	932	96.7%	3130	96.3%		
	LGBT	44	3.3%	45	4.7%	32	3.3%	121	3.7%		
Pregnant (valid n=1,020 females ages 18-44)	Yes	27	9.3%	6	1.4%	28	9.6%	61	6.0%	1	0.8%

*84.6% of North Dakotan tobacco users had any type of health care coverage

Overall, NDQuits registrants were more likely to be heterosexual, white, female, 25-34 years old, privately insured, and had at least a high school degree

In general, NDQuits registrants in FY17 were likely to be heterosexual, white, female, 25-34 years old, privately insured, and have at least a high school degree. When compared to ND tobacco users overall, NDQuits program *users* were more likely to be female, pregnant, and with at least a college or university degree, and less likely to be age 18-24 and American Indian/Alaskan Native, compared to tobacco users in North Dakota (see Figure 35).

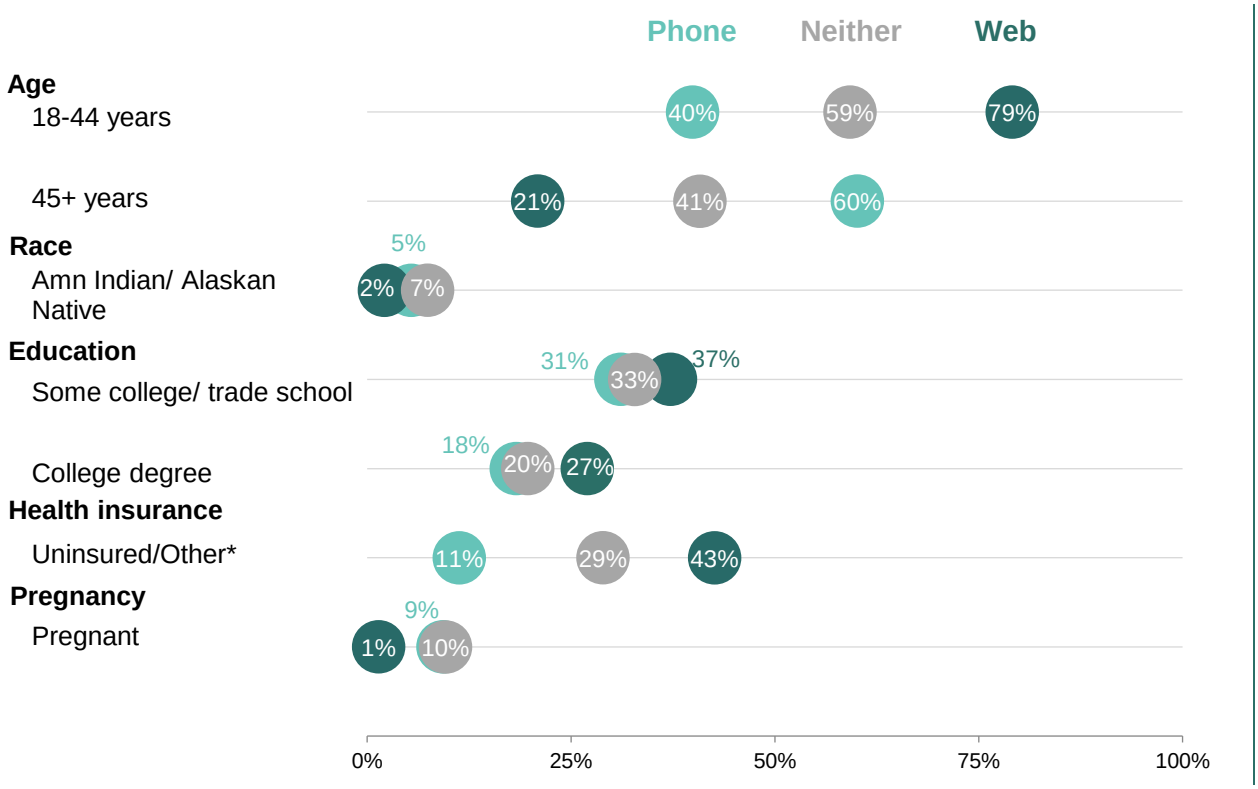
Figure 35: Comparison of NDQuits program users to tobacco users in North Dakota (ND BRFSS)



When examining participants by **program used** (using FY17 outcomes data), NDQuits participants who used the web program were more likely to be younger (18-44), white, to have at least some college or trade school education, and to be uninsured or insured in another manner (than private insurance, Medicare, or Medicaid, see Figure 36). NDQuits participants who used the phone program tended to be older (45-65+), with less education (high school/GED or less) and insured via Medicaid and Medicare than the web users and those that did not use either program. In addition, a greater percentage of residents of some other race or multiple races used for the phone program (6.5%) than the web program (1.2%) or neither (5.6%). A greater percentage of pregnant residents used the phone program (9.3%) or registered for but did not use either program (9.6%) than pregnant residents who used the web program (1.4%). Lastly, a greater percentage of American

Indian and Alaskan Native residents registered for but did not use either program (7.4%), than those that used the phone program (5.4%) or the web program (2.1%).

Figure 36: Demographic characteristics by program used



*Insurance other than private, Medicaid, or Medicare

Table 11: Tobacco use characteristics of FY17 program enrollees (N=3,266)

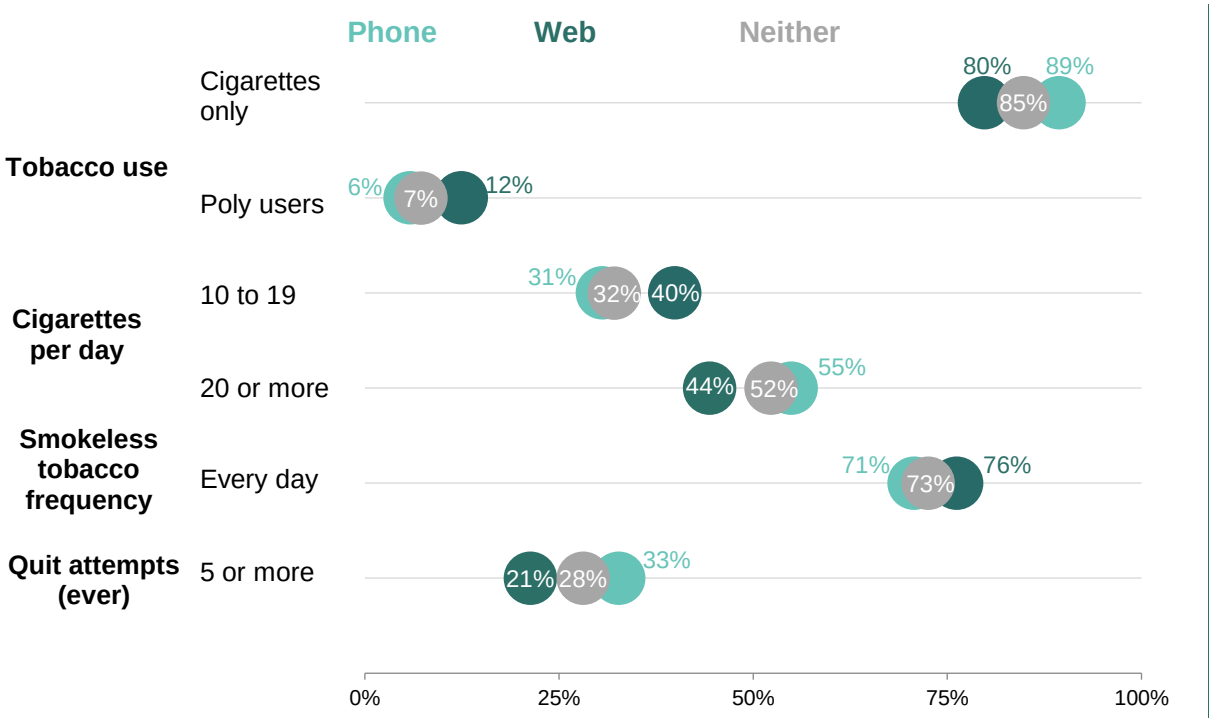
		Phone (n=max of 1,326)		**Web** (n=max of 965)		**Neither phone nor web** (n=max 975)		**Overall** (n=max is 3,266)	
		n	%	n	%	n	%	n	%
E-cigarette use (missing n=39)	Yes	97	7.3%	112	11.8%	103	10.8%	312	9.7%
Tobacco use (n=56 missing or responded 'no' to all tobacco products listed)	Any tobacco	1299	98.0%	954	98.9%	957	98.2%	3210	98.3%
	Cigarettes only	1161	89.4%	761	79.8%	812	84.8%	2734	85.2%
	Smokeless only	50	3.8%	70	7.3%	71	7.4%	191	6.0%
	Other tobacco (pipes, cigar, other)	13	1.0%	5	0.5%	5	0.5%	23	0.7%
	Poly users (2-6 types of tobacco)	75	5.8%	118	12.4%	69	7.2%	262	8.2%
Cigarette frequency (missing n=1,238)	Every day	1133	91.9%	162	94.7%	585	93.8%	1880	92.7%
	Some days	50	4.1%	9	5.3%	23	3.7%	82	4.0%
	Not at all	50	4.1%	0	0.0%	16	2.6%	66	3.3%
Cigarettes per day on days that you smoke (missing n=345)	Less than 10	173	14.6%	137	15.7%	134	15.6%	444	15.2%
	10 to 19	363	30.6%	348	39.9%	276	32.1%	987	33.8%
	20 or more	652	54.9%	388	44.4%	450	52.3%	1490	51.0%
Time to first cigarette after waking (missing n=1,319)	Within 5 minutes	497	42.3%	75	43.9%	271	45.0%	843	43.3%
	6 to 30 minutes	438	37.3%	61	35.7%	199	33.1%	698	35.9%
	31 to 60 minutes	118	10.1%	22	12.9%	72	12.0%	212	10.9%
	More than 60 minutes	121	10.3%	13	7.6%	60	10.0%	194	10.0%
Smokeless tobacco frequency	Every day	65	70.7%	16	76.2%	50	72.5%	131	72.0%
	Some days	20	21.7%	5	23.8%	17	24.6%	42	23.1%

(missing n=3,084)	Not at all	7	7.6%	0	0.0%	2	2.9%	9	4.9%
How many quit attempts (ever) (missing n=1,068)	0	112	8.4%	20	10.6%	80	11.7%	212	9.6%
	1-2	455	34.3%	72	38.3%	237	34.6%	764	34.8%
	3-4	325	24.5%	56	29.8%	175	25.6%	556	25.3%
	5 or more	434	32.7%	40	21.3%	192	28.1%	666	30.2%

Overall, NDQuits registrants were more likely to smoke cigarettes only, smoke every day, were heavy tobacco users, and had at least 3 previous quit attempts

PDA also examined differences in tobacco use characteristics among program registrants by program used (phone, web, or no program usage) using the FY17 outcomes dataset. In general, the majority of NDQuits registrants in FY17 smoked cigarettes only, smoked every day, smoked 20 or more cigarettes on the days they smoked, had their first cigarette within 30 minutes of waking, and had at least 3 previous quit attempts. The majority of NDQuits registrants who went on to use the phone program, web program, or neither program reported using cigarettes only, while the web program served slightly more poly-tobacco users (see Figure 37). The web program also tended to serve more residents who smoked 10-19 cigarettes per day on the days they smoked and used smokeless tobacco every day. The phone program tended to serve more residents who smoked 20 or more cigarettes a day and had 5 or more quit attempts at registration.

Figure 37: Tobacco use characteristics of program registrants by program used



Appendix 5: Follow-up Respondent Representativeness

Response bias analysis

In order to assess if and how survey respondents were representative of all NDQuits participants, PDA conducted a response bias analysis, comparing survey respondent characteristics with those of non-survey respondents at enrollment. As sampling is exhaustive, this analysis is really comparing survey responders with all other participants in the study population. Differences were assessed for 14 demographic and clinical variables including: gender, age, race, ethnicity, education, insurance status, sexual orientation, pregnancy status, types of tobacco used, number of cigarettes smoked per day, time to first cigarette after waking, frequency of smokeless tobacco use, e-cigarette use, and number of quit attempts.

FY17 follow-up data

For the FY17 follow-up data cohort, the survey respondents in FY2017 differed in several ways from the non-respondents (significant at the .05 level). Specifically, responders were older at intake, more highly educated, more likely to have health insurance, and to be less addicted to cigarettes.

Potential implication of response bias on 30-day quit outcomes

Because there are several significant differences in the responders vs. non-responders, the follow-up survey responses should be interpreted with caution. When comparing quit rates by these variables, there were slight differences in quit rates (for instance in older vs. younger respondents) though none reached statistical significance. Because of differences in characteristics (such as age, race, type of program), results may not be generalizable to the larger population that enrolls in NDQuits.

Table 12. Variables that differed significantly by response status

		Survey Respondents	Non-respondents
Age at Enrollment (Pearson $\chi^2(5) = 130.126$, p <.001)			
18-24	↓	6.1%	12.9%
25-34	↓	19.2%	29.0%
35-44		16.8%	20.3%
45-54		18.1%	19.1%
55-64	↑	26.6%	12.8%
65+	↑	13.1%	5.9%
Education (Pearson $\chi^2(3) = 13.191$, p = .004)			
Less than HS degree		8.6%	10.4%
High school degree/GED	↓	31.9%	37.6%
Some college or university		33.5%	31.6%
College or university degree	↑	25.9%	20.3%
Insurance (Continuity-Corrected $\chi^2(1) = 16.246$, p <.001)			
No	↓	18.4%	26.4%
Yes	↑	81.6%	73.6%
to First Cigarette After Waking (Pearson [OBJ][OBJ]χ3) = XX10.8, p = XX.5)))			
Within 5 minutes	↓	36.6%	45.2%
6 to 30 minutes		37.1%	34.9%
31 to 60 minutes		13.2%	10.0%
More than 60 minutes		13.2%	9.8%

Type of tobacco used and e-cigarette use at enrollment were both statistically significant, though the differences were < 5%.

FY14-FY17 combined follow-up data

There were also several ways in which survey respondents and non-respondents significantly differed for those who were followed up in FY14 – FY17 (at the .05 level). As sample sizes were so large by combining all years of data, only those significant findings with differences of at least 5% are shown.

Table 13: Variables that differed significantly by response status

		Survey Respondents	Non-responders
Age at Enrollment (Pearson $\chi^2(5) = 397.627$, $p < .001$)			
18-24	↓	7.1%	13.8%
25-34	↓	20.4%	28.7%
35-44		17.0%	21.1%
45-54		21.7%	19.3%
55-64	↑	22.1%	12.1%
65+	↑	11.7%	5.2%
Insurance (Pearson $\chi^2(4) = 132.100$, $p < .001$)			
Uninsured	↓	21.4%	29.6%
Private		31.2%	29.5%
Medicaid		16.1%	20.4%
Medicare	↑	19.2%	10.7%
Other		12.1%	9.9%
Time to First Cigarette After Waking (Pearson $\chi^2(3) = 18.784$, $p < .001$) (Asked in phone registration only)			
Within 5 minutes	↓	40.6%	47.0%
6 to 30 minutes		36.5%	33.5%
31 to 60 minutes		12.1%	10.2%
More than 60 minutes		10.8%	9.3%

Gender, race, education level, sexual orientation, pregnancy status among women aged 18-44 years, types of tobacco used at intake, frequency of cigarette use at intake, e-cigarette use at intake, number of quit attempts were also significant though the difference was less than 5 percentage points.

Appendix 6: Logistic Regression

Predictor Variable Availability

The first step in running the regression model to see which variables are predictive of quitting was to investigate the availability of predictor variables. As displayed in Table 14, many variables important to quit status were not available for the web program. Variables that were available for both programs for all cohorts include: age, gender, race, geographic region, tobacco types used at intake, cigarette and smokeless use at intake, health status (mental and physical) at follow-up, e-cigarette use at follow-up, reasons for e-cigarette use at follow-up, NRT shipped from registration to follow-up, NRT reported at follow-up, days of phone counseling from registration to follow-up, days of web logins from registration to follow-up, and text enrollment.

Table 14. Variables important to quit status

Variables (*=special population identifier)	**FY14 outcome cohort** (Aug 2013 - Nov 2013 enrollees) N=357	**FY15 outcome cohort** (Dec 2013 - Nov 2014 enrollees) N=995	**FY16 outcome cohort** (Dec 2014 - Nov 2015 enrollees) N=797	**FY17 outcome cohort** (Dec 2015 - Nov 2016 enrollees) N=636
Hispanic	okay	High web missing	okay	okay
Sexual orientation (*)	High web missing	High web missing	okay	okay
Pregnancy Status (*)	High web missing	okay	okay	okay
Education Level	High web missing	High web missing	okay	okay
Insurance (*)	High web missing	okay	okay	okay
Cigarette Frequency (Everyday, Some days, Not at all)	High web missing	High web missing	High web missing	High web missing
Cigarettes per day	okay	High web missing	High web missing	okay
Time to First Cigarette After Waking	High web missing	High web missing	High web missing	High web missing

Variables (*=special population identifier)	FY14 outcome cohort (Aug 2013 - Nov 2013 enrollees) N=357	FY15 outcome cohort (Dec 2013 - Nov 2014 enrollees) N=995	FY16 outcome cohort (Dec 2014 - Nov 2015 enrollees) N=797	FY17 outcome cohort (Dec 2015 - Nov 2016 enrollees) N=636
Smokeless Tobacco Frequency (Everyday, Some days, Not at all)	High web missing	High web missing	High web missing	High web missing
How many previous quit attempts at intake	High web missing	High web missing	High web missing	High web missing
E-cigarette use at intake	High web missing	High web missing	okay	okay
Other support	okay	okay	okay	Missing- cut questions due to lack of variance & DoH no longer interested
Number NRT weeks (registration to 7-month)	okay	okay	Missing variable but can get	Missing variable but can get
Health Status at intake	High web missing	High web missing	okay	Missing for June-Dec enrollments---bad field

Regression Model Methodology

Despite the responder bias, a multivariate logistic regression analysis was run using data for those who registered for the phone program only as those registering for the web program had significant amounts of data that were unavailable, possibly masking factors significantly associated with quit rates. The analyses were conducted using data from fiscal years 2014, 2015, 2016 and 2017 follow-up survey dataset described further in Appendix 1.

Stepwise regression models were run to determine the sets (or blocks) of variables to include in the final model that would produce the most accurate and meaningful results. Entering the variables in blocks minimizes missing data issues as variables that don't enter the model are excluded from further models. Blocks included available variables that were expected to have an impact on outcomes.

The preliminary phone model was ran using N=2,046 records. The model explained and fit the data was acceptable with a Nagelkerke R-Square of 13.3% and a non-significant Hosmer and Lemeshow Test ($\chi^2(8)=8.46$, $p=.390$). Of all the factors mentioned above, the only factors to contribute significantly to predicting quit outcomes include year, geographic region, type of tobacco used at intake, overall health status at follow-up, e-cigarette use at follow-up, and amount of coaching. While these factors are not unexpected, due to the response bias and the missing data issues, PDA feels that these results should be used with caution and have decided not to present the full regression results. Instead, PDA recommends correcting the data issues including assessing the survey protocols, attempting to increase the response rate, and getting follow-up data from a wider variety of participants in order to have better data for a predictive model in the future.

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